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TOURING AFOOT

By C. P. FORDYCE

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BY

DR. C. P. FORDYCE

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TOURING AFOOT

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CHAPTER I

HITTING THE TRAIL

WALKING tours are popularly supposed to be feasible chiefly for those to whom this method of travel is incidental to their occupation—timber cruisers, landlookers, prospectors, game wardens and trappers of the North—men who daily match themselves against the forces of Nature. To the average city man rarely does it occur that by substituting walking, our most natural means of locomotion—even if carried no farther than the daily to and from business trip—for the rapid transportation perfected in our modern industrial life he can attain better business efficiency and an increased physical and mental well being.

The average sportsman of today is in most cases a plain, unpretentious business man of sedentary habits and with a consequent physical condition a little below the normal, but fortu-

nately he retains a primitive unsatiated love of the outdoors. This same business man needs, as few others do, exercise to regain and retain health and efficiency. Without this exercise his occupation which keeps him indoors results in physical inactivity reducing his usefulness and happiness and markedly affecting his tenure of life. The average span of life is between 45 and 60 years. The age limit should extend from 80 to 100 years and this can be made the rule if we but go about it rightly. A large percentage of American business men have functional heart disease because of lack of exercise. They could well afford to walk daily until tired out in order to rid themselves of drawn faces, sallow cheeks, and weak hesitating steps. To them pedestrianism affords not only profit but real pleasure in getting away from the routine of city and office irk and hieing to the glorious out of doors.

Years ago man was a savage, and in spite of the restraining influences of civilization which have acted for centuries the spirit of this primitive life is still strong within. There is after all but one class of men who *live* in the world and they inhabit the wild places—the rest of us only exist. We do not thrive in cities but simply adjust ourselves to their unnatural and per-

plexing conditions. In the out of doors sheer physical existence may afford the richest pleasure.

It is commonly conceded as a well established hygienic fact that unexercised muscles become useless and inefficient, a condition which only properly directed physical exertion will restore to assist in meeting the exigencies of our modern top-speed life. This exercise must be varied to escape tediousness. Indoor gymnastics is not enough: outdoor games provide proper lung aeration but these are not feasible for all: pedestrianism is the simplest, safest, most spontaneous, and hygienic means of exercise. For most people no other sport is such an untasted experience, yet none is so productive of healthful results or so well adapted to the means, physique, and temperament of the masses. Indeed in this age of mechanical transportation we have almost forgotten that we were endowed with a pair of legs, given us for the sole purpose of walking—an essential exercise in the building up of healthy bodies and minds.

A three mile walk daily in the fresh air is an exercise par excellence and is within the reach of all. It may be tedious at first but when later it becomes a habit it affords real joy. The first

cost is in the adjustment of business cares and in selecting time: the next involves physical exertion itself. Anyone who has spent the greater part of his past life in a sedentary occupation can safely enjoy such trips if he uses common sense at the outset and starts, say, on a mile a day and gradually increases the length of the walk. Systematically followed pedestrianism accomplishes a number of things—there is better sleep, an increased circulation and new nerve force: all the muscles are brought into play as is proven by the general stiffness of the beginner (which however disappears on hardening) extra fat and flesh are eliminated and minor ailments are overcome. There is a real joy in living for with health everything is a pleasure.

Every one ought to walk and nearly every one who walks ought to do more of it than he does. Should pedestrianism become universal the present generation would be far healthier and happier and their children would be sturdier and more beautiful. The old English habit of taking a constitutional walk every day speaks in no small measure for much of the strength and stability of the British character. There is a general trend of interest in America to-day toward pedestrianism and many persons

are eager for information as to where to go, what to take and how to take care of oneself so as to derive the greatest benefit — queries for which we should now find answer.

Being mindful of the unlimited possibilities which walking affords for renewing youth the first task is found in the revolution of habits of living and the adjustment of the daily routine to include say two hours a day in road tramping. If persisted in a remarkable change will result — a notable clearness of mental power, keenness of appetite and a zest for life's work. It won't be long until one automatically increases the range and endurance.

Tramping may be arbitrarily divided into (A) Road Tramping and (B) Forest Cruising.

ROAD TRAMPING or real pedestrianism comprehends short walks as a training for physical well being which, as one becomes experienced, may be lengthened to include an occasional all day country tour as a wise utilization of holidays, or, one who becomes an adept may even plan to spend his annual two weeks' vacation period in a lengthy walking trip upon some of the better known highways in any civilized section of our country or in our National Parks or as a tourist in foreign lands. Road tramping is for those to whom walking appeals yet who

do not care to bother with the details incidental to camping. The trip should be so planned that the day's journey assures a comfortable bed and warm meals at hotels, inns or at ranch homes. This broadens one's walking opportunities up to the point where civilization and wild nature touch.

Such a trip is good recreation and a splendid sport and in no other way can one better familiarize himself with the country's topography and the characteristics of its people. On the longer trips a very simple kit suffices his needs —he wears suitable walking clothes, and carries a notebook, some few toilet articles, a change of underwear and hose and a rain-proof over garment—all packed in a rucksack of some sort.

The daily local walks taken by the pedestrian to secure health with the longer weekly jaunt, indulged in perhaps as a member of some walking club, afford an admirable preliminary preparation for more arduous outings such as a week's FOREST CRUISE, carrying in a back pack the shelter, bed and food and thus equipped one may break entirely away from civilization and eat and sleep independent of hotels or ranches.

Those who feel the vim of outdoor life, those interested in any phase of Nature study, those

wanting to get away from the city's humdrum existence, in short, all who want to recreate can plan no more repaying or zestful days than those spent with a back pack outfit touring the unknown wilderness near home. It may be for any one of a variety of purposes—camping, hunting, fishing or trapping, it matters not what, the main thing is that one gets near to Nature in her primitive state. Amateur exploration has the interesting element of mystery which leads one into all sorts of country right around home and which one never dreamed to be in existence. There are still greater opportunities if one gets off the beaten tracks and steers his course far into the back country.

One returns from such a trip with renewed and abundant vital reserve and with a veritable storehouse of happy memories. He has tasted the woodsman's life in all its elemental qualities — its seclusion and originality; he has learned the good there is in simple, hearty things and the exhilaration of spending nights in the mountain land or forest aisles under snapping stars in a moonlit solitude. He knows no greater pleasure than that afforded by experiencing the charm of wilderness adventure which enslaves him for life. A walking trip then becomes a real hike when one

leaves the highways, beds and meals of civilization and hits the woods trails which lead him far into the wilderness.

On a recreation trip good companionship cannot be overestimated. Firstly, on a light pack trip most items of outfit can be used as well by two as by one. Again if one walks alone the trail is apt to become monotonous and doubly so after a half of a day's trip has been completed. Good companionship stimulates a pleasant mental attitude and gets one away from the monotonous physical features of the walk itself. There may be also a pride in rivalry to spur one on to more worthy effort; otherwise he is apt to think only of his arrival at destination. Furthermore in the solitude of the great forests the establishment of the little bivouac home and the fathoming of the many secrets of the trail calls forth man's gregarious nature.

Look well to the choice of your bunkie for nowhere else do weak and strong characteristics come to the surface so forcibly as when men are thrown together in camp. As a matter of fact a wilderness pal of proper qualifications is really hard to find. He may be a jolly comrade in town but that does not qualify him as

a first rate camp mate. He must do an equal share on the trail and in camp, he should be physically fit, generous, fair minded and big enough to overlook the petty griefs incidental to rough trail life every where.

He who adventures into the big timber must look also with exactitude to the choice of an outfit, for the wilderness tramper matches himself against the forces of nature, and he must have equipment as well as the personal qualifications to surmount the difficulties successfully. The weight of outfit must be nominal since the packer must bear it alone from day to day, often through almost impassable country where the effort necessary in going forward alone is quite sufficient a strain without that of having to carry a single unnecessary ounce on his shoulders. A mistake in outfit may mean discomfort at least and possibly a spoiled trip. Life outdoors calls for a knowledge of equipment and methods which a large number of persons, because of their environment, cannot gain except from trial, or such as is imparted by some one more fortunately experienced.

Hence we do not speak to the seasoned campaigner or to him who on the short vacation can travel with full equipment and with guides

and who has abundant transportation facilities. The beginner however needs practical suggestions for going light into the wilderness alone and he welcomes simple hints for hitting the trail right.

CHAPTER II

GOING IN "LIGHT"

THE attractiveness of the outdoor life, its health giving attributes and its satisfying of the primitive in civilized man yearly draws hosts of enthusiastic adventurers into the wilderness. If he is experienced the woodsman sets about in a prosaic way to get pure enjoyment out of each day's routine and he is able to do this because he knows how. The novice however is apt to be influenced by poetic dreams and his ideas of kits and methods of woodcraft likewise theoretical and idealistic and sooner or later he is to be rudely awakened to his lack of the elemental, essential creature comforts which are so necessary to his welfare and enjoyment.

The wilderness dweller, if he chooses to be a true disciple of the Red Gods must 'go light,' In travelling light of course one must necessarily deny himself many things that under ordinary circumstances are deemed essentials, yet it in no way needs to be a deprivation. On

a back pack trip he must put his outfit selection through a rigid exclusion test. The equipment must be restricted to actual necessities such as food, requisites for cooking, shelter for the night and a good bed — all suited to the method of transportation. In camp and on the trail one will astonish himself at the makeshifts which he will invent to overcome camping discomforts as they arise.

The selection of any outfit lends itself to dispute because the choosing of its component parts is not an exact science but is more a question of temperament. The novice will suit himself as to what he will take, for he naturally follows the dictates of personal desires rather than absolute needs and usually he accumulates about twice as much equipment as conditions demand. Sooner or later his experience will guide him into the safe course: he will learn the science of smoothing it — of being comfortable — when he goes out to ' rough it.'

It goes unquestioned that the less you carry on your back the less will be your fatigue at the day's end: the smaller the burden you carry in your pack the more must be your knowledge of how to employ the artifices of woodcraft in utilizing nature's primitive stores.

The weight and bulk must be accommodated

to the means of transportation at hand. Thus for a hike in the wilderness with full outfit carried on the back you must boil the necessaries down to that irreducible minimum consistent with comfort whereas were you travelling by wagon or canoe you could be more indulgent. You will have "boiled" it down to the essentials when you carry the outfit from season to season without adding to or subtracting from it. This then is *your* ideal kit for it has withstood the "acid test" of experience. What one man calls a necessity another calls a luxury, yet this same luxury if the second man wants it bad enough becomes forthwith a necessity.

Having a proper equipment and enough courage for the undertaking it is astonishing to see with what confidence and independence two healthy men can cut loose from their civilized surroundings and with what comfort and happiness they can live out of doors during a considerable vacation trip.

PERSONAL EQUIPMENT

In choosing clothing for a wilderness hike, style plays no important part: comfort and service are the main requirements. In general it is a safe rule to adopt that kind usually worn in the locality where you go.

The coat is to be at once eliminated. One never needs it: it is cumbersome, it impedes the swing of the arms and is no protection in inclement weather. It readily soaks up water or if made of waterproof stuff moisture is condensed inside. A good wool sweater is far preferable and should be included in every individual pack; you won't use it much more than for a warmer at the evening camp.

The best headgear is an old felt hat of medium brim so the brush won't forever be snatching it off. It will stay on the head better if you get the hat a size too small and rip out the lining so that the felt can cling to the hair.

Wear a coat style shirt always of wool or flannel and of a gray or tan color which won't show dirt so badly as the popular blue does nor is it so conspicuous. To allow for shrinkage get it a size too large in the beginning and of medium light weight because if too heavy it becomes cumbersome in your work: two military bellows pockets with buttons are convenient for small stowaways.

It is quite advisable to waterproof all woolen items in the outfit after the following methods: secure three ounces of anhydrous wool fat and dissolve in chloroform. This is added to one gallon of benzine and the garments soaked

therein for three minutes and then hung up to dry in a draft. The volatile benzine evaporates leaving the fibers of the wool encased in the natural oil. This is of particular advantage to the outdoor man since the woolen fibers thus treated do not soak up water and swell but only allow water to fill up the air interspaces of the fabric from which it can be readily expelled.

The trousers will be subject to great wear and should be chosen for service rather than for looks or warmth, which latter will be taken care of by the wool undersuit. Khaki is light and cool but it notoriously displays dirt. Moleskin or whipcord withstands the hardest usage and is windproof and warm. It is the choice of the Hudson's Bay men whose discrimination in matters regarding outfit is to be respected. The fit of the trousers is a most important thing if one is to walk in comfort. They must not draw at the knees which would mean speedy fatigue on the march and they should be of abundant length with plenty of width from the knee to the hip. The knickerbocker style formerly evolved a smile of ridicule from some lookers-on but after trying all sorts and kinds one must concede the " stagged " style the best for woods walking. If you have long trousers cut

them off half way up to the knee, slit them the rest of the way up and fold over to a snug fit about the calf and secure with lacing or buttons. The heavy wool socks should be brought up over the pant legs and with this arrangement one is able to travel with more comfort than with the long trousers. Suspend the pants from the hips by a good leather belt.

The selection of the undersuit requires more care than the outer garments. Preferably it should be a loosely fitting union suit of pure soft wool regardless of season. Wool absorbs perspiration and prevents chill. Cotton on the other hand retains perspiration and is a clammy chill producer when the body begins to cool off. Never use thick underwear even in winter: better have an extra undersuit, a size larger than the one ordinarily worn, for doubling up in cold weather. Two thin suits worn together are warmer than a thick one weighing as much as both: this is due to the dead air interspace between the two.

In a pocket carry a good jack-knife with two blades of first class steel: never take one of the many-tool kinds. Except on an extended trip you will not need a sheath knife. One with a five-inch blade and housed in a leather sheath with belt loop is best. A good butcher knife

makes an admirable implement for the purpose. The waterproof match box of metal or rubber should always be carried on the person and see to it that it is kept well filled. The supply for this pocket safe is to be drawn from the moisture tight match can carried in the pack sack. The usual blue bandanna handkerchief will occupy its place in the hip pocket and the compass should be worn in a shirtpocket and secured to a button hole by a rawhide thong. Or one may use a compass which pins on the shirt front thus being always in view and giving the hands freedom for use in other ways.

CHAPTER III

WOODS WALKING WITH A PACK

THERE is a certain trick in learning the technique of walking outdoors. Unless one takes up pedestrianism to make the most of it he is not apt to perfect himself in an art universally practised in a slip shod fashion and yet which is one of the simplest functions of the human body. Just this careful attention to details is what distinguishes the pedestrian from the mere stroller. Indeed one must walk with the head as well as with the feet, studying to eliminate the faults of gait. The secret is to find how to walk with the least effort to relieve body rigidity and thus conserve vital force.

The gait of the average townsman is that of a stroller—a distinct up and down action with rather rigid hips, the toes very likely pointing outward and the heels striking first and disturbing the balance. The carriage may be erect enough and the movements springy and graceful over firm level footing but it is an ill poised gait and exhausting should one endeavor

to lengthen the step or cover the ground in good time.

Essentially the difference between the above gait of the stroller and that of the pedestrian is one of hip action, joint looseness and manner of foot implantation. The novice will in all likelihood begin his practical walking on country roads and to him is now addressed the main features of the proper gait in pedestrianism. He will probably be unencumbered with a pack and will have a firm, level surface for walking with consequent freedom to develop a gait of definite " form."

In the best regulation gait — the long swinging stride — the knee gives a little as the weight of the body is placed on that leg but not so much as to bend the knees. It is midway between the bent knee stride of the French Army and the extreme conventional stiff kneed " goose step " of the German Army. The foot is kicked well forward and by this the rate of speed is regulated rather than by pressing the foot against the ground as it leaves it, which is fatiguing. The body is held erect, chest up and shoulders back but not strained nor lifted. The movements are graceful and springy as no joint is held in rigidity. The eyes are fixed about 35 feet ahead.

There is considerable of a swing at the hips, in fact a distinct roll — the hips swaying an inch or more to the stepping side with a corresponding long pace. The leg is swung back and forth from the hip, the knee joint aiding this motion by adapting the leg to the irregularities of the ground surface. As employed by professional long-distance walkers the hip action is somewhat exaggerated. The hip roll is regulated to some extent by the swing of the arms which should alternate with the leg action. This is a means of instilling a lot of energy into the gait. The tendency is to overdo — to swing too vigorously and by overswaying disturb the body balance with a resultant fatigue. As an aid to this, some professional walkers use a two foot light walking stick or riding crop held in the hands. The arms may be held any way desirable but it is advisable to carry them well up.

Woods walking with a pack differs greatly from common road touring. In his primitive forest habitat the woodsman can outwalk the experienced pedestrian for he has the knack of negotiating a steady gait over uneven and slippery ground, edging through thickets and worming his way amid fallen timber, rocks, brush, etc., with less fret and exertion than one

who is accustomed to smooth, unobstructed paths. The woodsman besides having the handicap of traveling over an uneven surface is more or less encumbered by a pack which even if made as light as possible gives the hiker a taste of real work. The long swinging gait of the bushman is less tiring than the straight ahead stiffer stride of one who walks on smooth ground as on city pavements. This woods walking is acquired with experience as a result of physical adaptation to repeated emergency footing exigencies.

The poise of an Indian in the act of stepping would be found to be a perfect body balance on each foot. This allows great control over movements: the characteristic silent stealth of the redman displays the greatest economy of vital force. He conserves his strength and makes every step count, often going around many places which otherwise he could make with a hop, skip and jump — a desideratum in preventing fatigue in woods walking where the steps must be of unequal length and the footing so different.

There is no doubt that walking is unexcelled as a short cut exercise to the attainment of physical fitness. One should never try to accomplish too much at one time, for overdoing

disgusts one with the pastime. Start in easy, walk deliberately, adopt an easy, natural gait and maintain it. Short rests are permissible but if overdone they result in stiff muscles and chill.

The question of the number of miles to attempt on a day's tramp is tempered by the several conditions of roads, trails, altitudes, hills, size of pack, if on such a trip, and physical capabilities. One records then variations in tours from the accomplishment of but two miles a day with a back pack on a woods tramp over seemingly impassable swamp to the professional achievement of the famous Weston who between his seventy-first and seventy-second birthday walked from New York to California and back at the rate of 46 miles a day.

For the average business man a one to five mile tramp each afternoon is an admirable and perfectly feasible exercise: in fact this distance is covered by many in their daily activities. Take the first mile or two slowly to limber up. Daily one can increase the distance as the perfecting of the stride and endurance permits until he can cover twenty to twenty-five miles a day in road walking without injury — a feat not difficult to attempt if one is in good health. Taken as a once a week culmination to the

daily several mile walk the twenty-five mile walk is as much as the inexperienced walker should take and not feel inconvenienced. For the experienced a trip of this length would be merely incidental.

Three miles an hour is comfortable for a day's trip. The infantry gait is three miles and is sufficient for the amateur who is out for his health. It is not easy to walk four miles an hour and keep it up and it is certainly too much for the novice to attempt.

In estimating the rate of travel measure your pace, the average is two feet in length, and time yourself for the approximately 2500 paces per measured mile, counting the 1250 right foot implantations, and then use time for estimating distance rather than the linear measure of mileage which latter is impossible in the unmapped wilderness. If you care to be more exact the pedometer can be used. Don't try to break the record — it is endurance not speed that counts. Be free to choose your course, and never hurry lest self reprehension come upon you. It is the traveler on foot who has the time to receive and reflect upon his impressions and at the same time pleasantly rejuvenate his body and mind.

For one contemplating a long twenty-five mile

or so hike it is well to choose a route where it is never necessary to march very far in a day for lack of intervening accommodations. In most of our country this is easily accomplished. The annual vacation hike can be well spent in one of our National Parks, the walkers' paradise. Here the pedestrian can start from one of the many noted tourist centers and be certain of accommodations before the next night's resting place: he can obtain vistas of famous scenery and gain a storehouse of pleasant memories which fully discount any hardship he may have experienced on the trail.

To accomplish a hike in the most approved form the arrangement of meals and travel should be varied somewhat from the conventional customs. A fairly early morning start should be made with but two meals in view — a ten a. m. breakfast and a five p. m. supper with perhaps a brief midday pause and a prepared lunch. This gives the man who cooks his own meals a long stretch of time for getting over the ground without the worry and time of cooking a noonday repast.

A nine to ten hour sleep is none too little for anyone enjoying the healthful outdoor life, in fact the increased amount of sleep that one seems to require is one of the upbuilding fea-

tures of such a trip and is not to be cut short for any reason. The amount of sleep needed is of course subject to individual peculiarities.

In real hot weather start at daybreak and you can get in a half day's journey by the time the sun is hot. Slow down at the heat of day and hunt a shady retreat. On such days drink but little water and have it pure. One will perspire freely, which is good, for this is Nature's way of cooling the body by evaporation: if one stops sweating there is real danger of heat stroke.

In wilderness travel the most dependable guides are the compass, combining with the North Star by night or the sun by day. Night travel is based on the North or Polar Star as the infallible guide. It is located by means of the big dipper which should be known to everyone. The two stars farthest from the handle and lowest are nearly in line and are called the " pointers."

Of course, if the sun is shining you will have a reliable guide to direction, depending on the time of day.

The seasoned woods traveler goes principally by direction and he has developed to a higher or lesser degree the " bump " of locality or instinct of direction developed by his trained

close observation. He gets the lay of the land, noting little things which are unusual, such as rocks, trees, sounds, course of stream flow, flora and fauna of the country and then he travels north, east, south and west of some special landmark, as a river, mountain, lake, etc. The use of the compass, North Star, etc., is much preferable to travel by landmarks, for north is always north whereas two landmarks may look alike and hence bewildering. If you expect to retrace your steps you should look frequently backward and impress the salient features of the landscape on your memory such as a cliff here, a distorted tree there, and the like.

In such a region, too, one should blaze the trail by chipping the bark off trees at intervals along the way and on both sides of the tree if one is to retrace the route. In a country covered by bushes blaze the trail by bending over a green bush in the direction in which you are going, snapping the stem or chopping it with an axe: the top pointing away from the trail. The underside of the leaves being of lighter shade than the upper marks such a sign conspicuously in the wilderness.

If you intend to hunt in unfamiliar territory where you must depend on your compass to get you out, a map showing the topography of

the land is of great benefit. These quadrangles can be secured at the State Land Office, county seat or at the United States Land Office, the Post Office Department or of the United States Geological Survey, Washington. They are compiled from the field notes of surveyors and they indicate the location of streams, lakes, roads, mountain ranges, swamps, etc.

CHAPTER IV.

MAP READING

A KNOWLEDGE of the rudiments of map reading is essential to the camper who has occasion to travel into wilderness haunts. He should have a clear mental conception of the ground to be covered and the map furnishes this — the corresponding distances, the net work of streams, roads and trails, and the elevations and slopes.

The starting points for all surveys are the five principal meridians which run north and south. The range of the townships are numbered on this line east and west and all reliable maps have the base lines and meridians indicated. The townships are further divided into thirty-six sections of six hundred and forty acres each and each section measures one mile square making a total section measurement of six miles square. The corners of all sections are marked in the field as follows: — In the open country mounds are placed by the government surveyors and surrounded by four pits —

one pit on each section of land. Within this mound will be found a stone with as many notches cut on the east and west side as it is miles to the township line. In timbered regions instead of a stone marker the intersections of the section lines are marked by a stake and the four sides facing the sections are blazed and the data of sections, township and range marked and notched the same as on the stone markers. Midway between the half section intersections the markers will have but two pits — one on either side and representing the quarter sections and marked 1–4–S–.

The United States Geological Survey topographic atlas sheets are the standard and are designated by the name of the principal town or of some prominent natural feature within its boundary. The names of the adjoining published sheets are printed on the margins. They are the base maps on which the geology and mineral resources of a quadrangle are represented. Of these the hiker is likely not interested but the map to him is invaluable because of the following: it represents to him: —

1. The distances which are shown by a scale based on a fractional proportion between the land area and the map area. The scale most used for thickly settled or industrially impor-

tant parts of the country is one linear mile to one linear inch, the proportion of which is 1:63,360 and the map represents a ground area of 15′ of latitude by 1′ of longitude. The map used for the greater part of the country covers an area of 30′ of latitude by 30′ of longitude with a scale of two miles to the inch or a proportion of 1:125,000. In the desert regions of the far west the map covers more territory hence the proportion is greater, 1:250,000. It covers an area of 1° of latitude by 1° of longitude with a scale of four miles to an inch.

2. On the map will be found brown contour lines which are arbitrary lines passing through points of like altitude, thus each represents but one level, such as the shore line at the sea side, and the map presents all the eccentric meanderings of the latter. Every few feet in elevation above sea level or depression below sea level is represented by a contour line and the contour interval or vertical distance between lines is stated at the bottom of the map. This varies from five feet on comparatively level country to 200 feet in the mountains. Usually on about every fifth line appears the exact elevation of that point above sea level. Contour lines close together indicate sudden rise or fall of ground and when these lines are far apart

a more gentle slope. Where they bend abruptly inward they represent a valley.

From the contour lines we get the relative height of the hills and depth of valleys, and whether they are concave or convex and thus they give the data of the relief or profile of the land — the mountains, hills and valleys.

3. Aside from presenting to us the distances of a region and the relief data represented by the contours which are printed in brown the topographic map pictures the water (sea, lakes, rivers and streams) printed in blue and the cultural works of man printed in black. The features are all indicated by conventional signs, a key to which usually is printed on the back of the map.

In reading a map you first direct the upper edge to the north by the aid of the compass or, if the sun shines, by the aid of a watch. Next you locate the camp in relation to prominent landmarks, trails, roads, streams and contours. Then as you travel you note the configuration of the ground, the general direction, and the landmarks. If the general course of the trail is south and west and you are to detour north of it you will only have to run south to get back to your base line or camp. If your course varies to the east or north it will be necessary

to make the same distance west or south to get back to your starting point.

After a little practice in map reading one becomes proficient and he will be able if in unsurveyed territory to make his own map. Get the compass directions from the camp of every prominent landmark with particular attention to streams and the ridges separating them. If one is out exploring it is a good idea to climb to the summit of some bare faced promontory and there study the topography of the country: — the location of the lakes, swamps, whither the streams run, the number and direction of the ridges, etc. The mental map thus made will be vastly useful later on.

In traveling over hilly or mountainous country follow the courses at the heights of land. It shortens the way for if the streams are followed one may have to cross many tributaries and make long detours.

THE COMPASS AND ITS USES

For the average woods hiker a compass is a necessity in laying out the course of travel. Men whose business keeps them in the wilderness seldom carry the instruments but in them is developed to a high degree the bump of locality — that instinct that points the way —

coupled with trained observation of land signs along the trail.

Consult the compass often, otherwise you may swing so far from your course in going only a short distance that you will be inclined to doubt its accuracy. In choosing a compass one need not go beyond the price of two dollars for a serviceable and accurate instrument. The size is not so important, a ¾ to 1½ inch dial is large enough for sportsmen. The needle or pointer should have an agate bearing or jewel firmly set in the brass cap and to be accurately balanced on the fine tempered or pointed pivot. It is very important to have the box water-proofed else the needle will stick.

The principle in use comprehends the presence of a theoretical magnetic North Pole located northwest of Hudson's Bay, which attracts the blue end of the compass needle from all parts of the northern hemisphere causing it to point in that direction. Should one wish to lay a fairly accurate course, have both hands at liberty, hold the compass in both hands at half arm's length from body with elbows resting against your sides so as to bring the compass in direct line with the center of your body. To settle the needle quickly tip the compass until

the end of the needle touches the glass to check the vibrations. Repeat this quickly two or three times as needle passes the center of the arc it is making. Then carefully level the box to stop the needle from vibrating. When the needle swings free and finally stops the compass can be easily turned until the letter *N* is under the blue end of the needle and then one has all parts of direction. It is well to remember that the needle is affected by proximity to iron and steel.

Remember, when reading your map that the meridian marked thereon is the true north. Your compass, as just explained, points to the magnetic north. Therefore, you will have to apply a correction to your compass reading, the amount necessary varying as you go east or west of a line which passes, approximately, from Mackinac Island, in Lake Michigan, to Savannah, Georgia. The further east you are of this line the more the north end of your needle will point west of north; the further west you are of this line the more your needle will point east of north, the amount of the deviation amounting to one minute west for each mile east of this line (or 1° for each 60 miles) and one minute east for each mile west of this line.

WHAT TO DO WHEN LOST

The catastrophe of getting lost besets almost every lone woods traveler sooner or later and frequently results in a panic as deadly as that which drowns good swimmers. Even trained woodsmen sometimes get " turned around " but they usually find their bearings soon because of the general knowledge of the country and the main landmarks, shapes and heights of mountains, the trend of the ridges, the prevailing winds, the general direction and ultimate outlet of the streams, etc. The danger of getting lost is further offset by a proper knowledge of taking one's bearings, by range finding, by the knack of traveling by direction and by correct compass reading.

Perhaps the greatest cause of one's being lost after separation from party is that during ensemble travel the leader is the only one who sees the landmarks. Upon leaving the camp place or headquarter's point one should note the landscape and know absolutely the direction he is taking, otherwise his compass will be of little value even though he can see the sun and knows that if, he points the hour hand of his watch to it, half way between that point and twelve o'clock he is directed south.

A lost man has a tendency to travel in a circle which is explained by some as being due to the fact that most men step farther with one foot than with the other. It can be avoided by selecting some distant object, walking straight to it, picking out another in the same line of travel and continuing to do this until one has arrived somewhere. One has the satisfaction of knowing that he will not find himself at the place he started from a short time previously. The compass then is invaluable and its directions must under no circumstances be questioned.

To further prevent the possibility of losing one's self he should blaze the trail as he tries to travel out and keep straight with the compass if there is no sun, moon or stars to act as guides. One cannot depend much on Nature's signs such as the preponderance of tree limbs on the south side, moss on the north side, etc. In a country that has been lumbered over old trails and woods roads should be followed down hill as the lowlands and water courses are the invariable destination of logs and these old trails and tote roads usually guide the traveler to some lumber camp or clearing from which a well defined road is apt to lead. As a last resort strike running water and follow it tena-

ciously. In it and along its shore the wanderer may perchance find food, he may possibly launch a raft upon it and he certainly will not die of thirst.

If you find yourself hopelessly lost the first thing to do is to keep cool and avoid panic for the greatest danger is fear which robs one of his judgment. If you are near a party and have a gun shoot twice in succession repeating after long waits.[1] Smoke distress signals are made by starting two green stuff fires about fifty feet apart. Get on a high point for a lookout.

The back pack man is in no immediate danger so long as his outfit is with him but let it be separated from him by mishap in a strange country and his woodcraft ingenuity will be taxed. If night draws close build a little bivouac fire and camp before dark, make yourself comfortable, get in plenty of fresh wood to keep up the fire all night, build a wind screen on three sides of fallen logs, brush and browse, and if possible lay something on the bare ground to keep you off the dirt.

One should make it a rule never to leave the

[1] The signal varies with the locality. In some sections it is one shot, then a pause, and then two shots in quick succession; in other localities it is two shots in quick succession, then a pause, and then a single shot. Ascertain what the distress signal in any locality is before venturing into the wilderness.

camp without taking a small emergency bag along which would greatly assist in case of getting lost. It should contain a compass, maps, First Aid packet, match box, fish line and hooks, emergency ration and a knife.

CHAPTER V

PACKS AND PACKING

BACK packing of the wilderness adventurer's outfit is one of the necessary evils to be endured for the privilege of enjoying the freedom of travel and the peace and quietude of cheerful camps in the untracked solitudes of the great outdoors. Truly its trials and tribulations are many, yet when fully mastered and one becomes an adept in cruising methods it spells absolute independence of everything except food supplies. Packing at best is a hard plod but it is to be remembered that there is a certain pleasure in even the roughest experience and that in after years only the pleasant things remain in reminiscence.

Much may be spared in the way of trouble and discomfort in woods travel by the selection of a correctly designed and properly hung pack carrier. Next to being properly shod the possession of a suitable rig for carrying the outfit from place to place is the most indispensable requisite for the hiker. The most common and

satisfactory article for this use is to be found among the array of tump lines, pack sacks or baskets, and pack harnesses, each designed for a purpose good for use in its particular field and very little elsewhere.

This choice in turn depends largely upon the weight of outfit to be carried which of course should be kept down to absolutely essential limits and within the personal physical capabilities of endurance. Tasks within one's strength are pleasing or at least tolerable: those beyond that strength are punishment.

The tramper's pack, inclusive of a ten days supply of provisions, need not weigh over thirty-five pounds. (The seasoned woods traveler will start with eighty pounds.) Any additional weight of grub will be directly proportional to the time one is to be out. It is always advisable for two persons to go together on such a trip for they can share the shelter, use the same cooking utensils and certain other nonconsumable items.

It is a fact unbelievable to the tenderfoot, yet readily attested by the experienced, that at the beginning the carrying of a thirty-five pound pack is entirely feasible for the average man and at the end of several weeks one can carry many more pounds with some ease. On a

short portage trip with canoe relief ahead a pack of one hundred pounds is conveniently transported on one's back. The footman, however, must be carrying all the time and the beginner will find a thirty-five pound pack a sufficiently heavy burden. This must include shelter, mess kit, bed and a week's supply of provisions. It is well to keep in mind that the pack lightens some each day as the provisions are used up.

The various pack carriers are so arranged that the weight is suspended either from the head of the woodsman, from his shoulder or by a combination of the two methods. It is to many a surprising statement that a much heavier load can be carried suspended by straps over the head than from the shoulders. This is due to the fact that one is thus enabled to utilize the powerful muscles of the neck. These muscles are generally poorly developed in the novice and this, together with the much better known method of shoulder suspension packing, is doubtless the excuse for the latter's popularity among other than experienced woods travelers.

The Indian-tump line or head strap is the pack carrier par excellence for the transportation of heavy loads. Such a load hangs en-

tirely from the head of the carrier and not from the shoulders. It consists of a head band of rather stiff leather about two and a half inches in width by two feet in length. To each end of this is attached a strap or thong of similar kind of leather eight to ten feet long but only an inch in width tapering to a still lesser width at the ends and fixed to the head band by buckles.

To make up the tump line pack proceed as follows: — the blanket or shelter cloth is spread out and the thongs laid lengthwise about a foot from either edge — the blanket is then folded inward and across the thongs. The items to be carried are then laid on the end of the blanket well up toward the head piece. The other end of the blanket, from the folds of which the thong ends are protruding, is pulled taut, tied together and passed around the middle of the pack. The knack of comfortable tump line carrying, once the neck muscles are developed and hardened, is in properly balancing the pack.

The load is lifted to the back, the strap passing across the head high up on the forehead and not on top of the head as might be supposed. The load must properly fall in position on the back or discomfort will certainly result

with a corresponding decrease of carrying ability. It should fit well in the small of the back, just above the hips. The method is very tiresome to the unitiated because of the strain on the neck and head but one soon becomes accustomed to it.

The tump line or head strap is the one to use if the pack amounts to much above thirty pounds. Indians are thus able to carry loads of several hundred pounds on short portages but when the outfit can be arranged into several seventy pound packs the woodsman prefers to thus break it up and make several trips. With the tump line one can carry goods of most any bulk and shape. The strap has many other uses about camp.

The pack carriers which are suspended from the shoulders are fitted with loops through which the arms are thrust and which are connected behind to the load with either a set of harness intended to be buckled around any sort of camp duffle or riveted and sewn to a sack or basket. Fifty pounds is about the limit of the pack which one with experience can comfortably carry suspended from the shoulders. Breast straps are required for use with all types of shoulder harness to fasten the arm loops together in front or they promptly slip off. In

case of accident in the water they are disengaged with difficulty.

One caution is necessary in selecting this type of packing apparatus. The shoulder straps must lead from a common center near the front and top of the pack and they may then attach as usual to each lower corner. The advantage in this single point suspension is this — if the straps hug close to the neck of the packer there is not the down drag or tire which would be the case were the straps nearer the points of the shoulders.

PACK HARNESS

The pack harness is good for transporting an outfit provided one does not have to open the pack on the trail much — a procedure taking up too much time. In making up such a pack the blanket and shelter are made into a compact elongated bundle. The loose articles of camp duffle, mess kit, food bags, and extras are shoved into a specially made sack of light

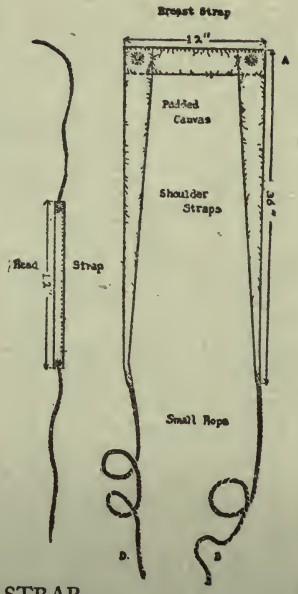
waterproof stuff of say twelve by thirty-six inch dimensions and with a tight-fitting top. The two bundles are placed side by side and the pack straps secured about them. The pack harness with the tump line combination is the best style to use if one prefers not to use one of the pack sacks.

The pack basket of wicker can be at once eliminated as it is too clumsy and bulky for our purpose and further it is not waterproof. It however fits very nicely into lithographs of supposedly ideal camp scenes. Being nonexpandable it limits the bulk of outfit. It is nevertheless popular with a certain class of New England outdoor men.

THE BELMORE BROWNE PACK STRAP

An ingenious packing apparatus has been perfected by Belmore Browne of the Parker-Browne Mt. McKinley Expedition of 1910. It consists of a padded canvas yoke which fits over the breast and shoulders of the wearer and the yoke ends connect by small stout ropes to the pack much the same as with a regulation tump line. The size of the pack regulates the length of the lash rope.

This pack strap is made very simply after



BELMORE BROWNE PACK STRAP

Method of using pack strap and tump line

Diagram of strap

the accompanying diagram. The length of the breast strap depends upon the breadth of the chest of the wearer. It is composed of a piece of ten tounce canvas of say twelve inch length and eight inches wide which is folded lengthwise making it twelve by four inches and is padded by felt or cotton. To either end of this is attached the shoulder straps consisting of double thicknesses of ten ounce canvas thirty-six by six inches and folded lengthwise and cut to taper from the yoke end. To its smaller end is attached a small stout rope of the length desired for the pack you will carry. The first twelve inches of the shoulder straps only are padded. The rope is lashed about the pack and the loose ends B and D are secured in the holes A and C near the arm pits.

To enable one to use the neck muscles also in addition to the shoulder straps a head strap is used. This is simply a double piece of ten ounce canvas two inches by twelve inches at whose ends are tied ropes which are attached to the pack. Browne has carried with this rig 100 pounds all day for several days at a time.

Various styles of pack sacks are extant. The foreign sportsman has what he calls a rucksack which means a " back sack " and which is a triangular shaped affair usually of waterproofed

materials which he hangs over his back by two straps passing up across the shoulders. The top is the puckered end of the sack and reaches up close to the neck, the flared out bottom hangs down to about the small of the back. It is sometimes fitted with pockets. It is very good for country road tours or for foreign sight-seeing trips where the items carried cover some such list as a noon day lunch, a raincoat, a change of underwear, photo films, notebook and guide book, but it is unsuitable for heavy weight work on the wilderness cruise.

The haversack or knapsack slung by a strap from one shoulder is out of date and never measured up to the requirements for use in heavy packing. It is handy for lunches or as a ditty or emergency kit bag. The best pack sack was originated and put out by one Poirier of Duluth some twenty-five years ago and was originally really the whiteman's improvement of the Indian tump line and pack cloth, ingeniously folded and tied so as to serve as a sack with suspension harness. As listed today by most outfitting firms it consists of a sack with shoulder straps and head suspension. It is a very desirable article from the point of view of the wilderness voyageur as he is enabled to ease up different sets of muscles while on the hike and

DULUTH PACKSACK
Illustrating head-band and single point suspension for shoulder straps

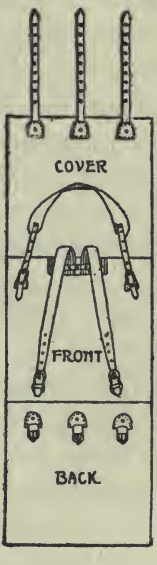


Diagram for making packsack at home. Fold along the lines.

in handling a heavy pack the combined use of the neck and shoulder muscles are brought into play.

This pack goes under the name of the Duluth, Poirier, Woodsman or Northwestern Pack and with slight modifications is listed under other names by various dealers in camp supplies. The genuine, however, consists of a simple flat bag of dimensions twenty-eight by thirty inches with adjustable shoulder and head straps. It has a large top flap with three long straps to hold it down thus enabling one to adjust it to a large or small pack. The following features are to be insisted upon — get the straps broad and soft and see to it that the connections are both sewed and riveted. The Poirier pack is much used on the Canadian border and is easily procurable or it can be made at home.

All things considered and especially in view of the ignorance of the average man as to how to adjust his pack straps properly the Woodsmans or Poirier is the best.

In its position on the back the pack should be carried low so the bulge fits the hollow of the back. If too high there is too much backward strain on the head and shoulders: if it is

too low it interferes with the gait. One can ease up the impact of a pack by letting the knees give a little with each step. In the case of heavy loads or a weak neck the strain can occasionally be relieved by clasping the hands behind the head or by slipping the straps from the forehead to the top of the head and grasping it with both hands about " ear high " so as to get a straight pull downward instead of backward.

CONTENTS OF THE PACK

With a properly chosen pack a man can comfortably carry on his back all that is needed for a two weeks' stay in the wilderness, inclusive of shelter, bed, cook kit, simple first aid requisites and the necessary provisions. Besides these the pack must carry miscellaneous items of duffle as follows:

Extra clothing may be very meager indeed. A gray all wool sweater for protection against cold, mainly at night or to be worn when washing the shirt, and two pairs of heavy all wool socks are all that one needs. In the way of toilet articles include a tooth brush and a tube of paste and two brown crash towels for the daily rub down. A bar of wool soap suffices

for toilet and laundry purposes. The map mounted on cloth should be encased in a waterproof envelope.

Provide a repair kit consisting of a few items for simple mending — a spool of stout linen thread No. 12, with suitable needles, a few rivets, safety pins, some waxed harness thread, needles and a light awl.

A good axe is almost indispensable. Although an experienced camper may learn to get along well no matter what is lacking, without an axe he is seriously handicapped for food, warmth and camp making and often protection from beasts and insects depend on the axe and the fire it makes possible. A gun may be dispensed with but never the axe. Don't try to economize too much in its weight. For average trips and moderately cold nights a light belt axe of say one and one-fourth pound head is about right. It should have a long helve and it will then give greater power than a heavy one with a short helve. Pocket axes are not advisable.

If the nights are cold and you have to keep up an all night fire in front of the leanto, an hour's work will enable you to spend the night fairly comfortable. You will need a large amount of good dry wood. To secure this the

axe had better be a well tempered, light regulation chopping axe of say a two pound head and a thirty inch handle. Never take a poor axe into the wilderness where comfort and oft-times life depend on it. Soft tempered edges bend where thin and if tempered too hard they will break in frozen wood or knots.

A small whetstone for sharpening must be with you. The combination coarse and fine carborundum sportsman stone is handy. A leather sheath will help to protect the axe edge from becoming dulled and the outfit from being cut. In use keep the axe clear of overhead limbs or brush which might turn it. Hold it rigid and learn to hit the spot aimed at.

The inclusion of fishing tackle depends on the nature of the locality you are to visit. Fish make an agreeable change from a bacon, biscuit and tea diet. Take a few hooks, a stout line, flies and spoon hooks and you can depend on improvising the pole where used. For bait you may be driven to bacon fat, frogs, grasshoppers or grubs from an old rotten log. If the prime object of the trip is for fishing purposes of course a more elaborate equipment is permissible. You really won't much notice the extra weight of a fish rod.

When every ounce and square inch of duf-

fel have to be debated over in view of the all important question of food supply and transportation facilities the addition of a small film camera bears few objectionable features. In no other way can a truthful record of vacation scenes be preserved. It truthfully portrays wild life in native habitat and is a great stimulus to personal observation. Almost any one can push the button and run a good chance of getting a clean cut picture, the clever thing is to amplify the camera's working with one's good sense in composing the picture. In woodland views when the sun is low expose to get the long shadows. In wild animal work get leeward to the trails. The lighting of your subjects should always come from behind the camera. Film must be protected from moisture and you can insure this in no way better than by getting the kind which is hermetically sealed as sold for tropical use and obtainable from the makers on special order.

CHAPTER VI

FOOTWEAR

THE most important requisite for the pedestrian is mobility. This in turn depends upon properly conditioned feet and a covering permitting the greatest ease in action and freedom from injury. So important is this physical item in the case of any one who walks that it may be taken as a criterion of one's ability to cover ground. Granting other things equal, the successful army is the one which marches best; hence one of the greatest military problems of the day is a study of the proper care and housing of man's pedal extremities. The measure of efficiency of the draft horse on icy pavements, of northern Indian packers over unbroken woods portages, and of the amateur pedestrian's initial hike over interurban roads depends essentially upon being properly shod.

In a study of the foot we find it composed mostly of bones and that their movements are managed by a complex arrangement of muscles,

in nearly every case by several sets working in unison. Any mechanical displacement of one bone throws not only all bones out of harmonious working order but also disarranges their accompanying muscles and the nerves attached to them, resulting in inefficient action and in radiating pains. The fleshy parts of the foot are at the sole, ball, on the bottom of the heel and along the outer border and they play the part of protection where it is most needed. The bottom flesh forms pads in walking and supporting the body, insuring springiness and lessening the jar which is incidental to locomotion. Shoes that do not fit the fleshy parts of the foot properly cause friction when walking and concomitant aches and pains.

X-RAY OF FOOT
Properly housed in form fitting shoes

Nature intended man to walk with bare feet but following the dictates of necessity as his environment demanded foot protection and later of an all too dominant dictate of fashion he took to wearing foot covering. Since the feet do an immense

amount of work Nature has so constructed them that they will adapt themselves to many conditions. It is our duty to adjust the foot covering to assist Nature in protecting the foot.

Commonly the fitting of shoes is influenced by a consideration of fashion and style and not comfort, with a resulting condition which most people cheerfully accept, thinking that by so doing their feet will appear small and neat but really causing a cramping and narrowing of the ball and toes, with possible chafing, blistering, callus or corns — conditions incompatible with walking efficiency.

The physical effects of ill fitting shoes are unfortunately evident with most people today. In addition if one is not properly outfitted on a walking trip the psychological effect is also bad, resulting in discomfort, reduction of buoyancy of spirit, mental irritability and diminished traveling capacity. He becomes an object of pity, his enjoyment is turned to grief and his value as a pedestrian is in a certain measure destroyed.

An entire reversion of shoe fitting ideas should be made and the shoes made to fit the feet instead of the feet to fit the shoes. The feet are not to be carelessly jammed into any sort of a container. A good shoe cover must

protect the foot, it must give security and be comfortable and durable without changing the foot shape in any way. To secure these things the fitting should have precedence over all other conditions. Properly fitted the shoe allows the foot to take practically the shape it would if it were not encased in a shoe. The last should be straight and from the outset do not regard the sole as too broad. There should be sufficient width at the end to allow the toes to lay on the inner sole of the shoe in a normal position, for when the weight of the body is placed on the foot the toes spread apart a little. Nature thus demands toe room. With the full weight of the body on the foot the toes should be able to wriggle about freely in a shoe. Walking causes the feet to lengthen one-half inch and broaden at the toe one-half inch. Provide for this swelling caused by the flattening of the arch and congestion of blood in the exercised region. The shoe should be long enough to extend well forward of the toes — two-thirds of an inch longer than the longest measurement of the naked foot; the inner sole border should be straight, broad across the ball and for average work on the roads need not be heavy but above all things it should conform to the foot. Have the heel fit snugly but across

the ball or front of the foot arch no compression at all.

The tendency is to overdo foot covering, getting the shoes too heavy. There is no need of lugging around extra weight. Aim for the minimum in leg weariness. Thick soles interfere with the leverage action of the big toe. The tramper covers territory and must look for ease, flexibility and lightness if at a sacrifice of the durability of the heavier goods.

The proper shoe should conform to the following specifications: — it should have a soft upper, making the total shoe height five inches, there should be no lining or box toe cap, the heels should be broad and welted and only three lifts high, the sole of one thickness. The shoe should be loose enough for free wriggling of the toes within and permit of the insertion of a cork innersole which serves as a kind of cushion for the tread and can be removed at night to dry out.

The shoe is the product of civilization and properly chosen is preferable for pedestrianism in the city and on country roads. Also in mountain work where wear is excessive and one must use calks or hob nails for security the heavy soled light uppered ankle-high shoe is advisable. Hobs of the small coneheaded

Hungarian variety are good on rough rocky country or where there is smooth short grass and add immensely to ease and comfort and safety in walking over mountain trails. Use these hobs sparingly. They give better foot hold and greatly save the sole and heel from wear. They should not extend through the sole.

For wilderness tramping in general the adoption of an entirely different sort of footwear is advisable. The real hikers — the men who make it a business of going on long trips with back packs do not use shoes. They wear the lightest, easiest wearing and most flexible foot covering they can get — the moccasin. The moosehide moccasin is the footwear of the Northwestern Indian who is the most tireless pedestrian in the world. Next to him is the Canadian voyageur with his oil tan shoe packs. Were the heavy soled shoe or boot the more satisfactory they would use it in preference.

The moccasin is a better foot covering than one would think. If you walk a few hundred miles in moccasins, on your return, you will be surprised at your carriage. You will stand easier and not sag on your heels in the clumsy attitude of the city man. In walking with moccasins you walk with all your feet, you don't

have a great foot weight to lift around and no binding heel or sole stiffness. One can walk noiselessly and is not likely to slip on rocks or logs. Some contend that the average city man has no license to tackle moccasins at least on the first week of the hike. They are hard on soft footed people for a time at least but the feet soon become accustomed to the change.

By the use of thick wool socks the foot comfort is still further assured. If one desires he can get soled moccasins or those with double bottom to prevent seam leaks, the outer sewed to the welt and the welt sewed to the sole.

The moccasin is absolutely unequalled for warmth, it is light and perfectly noiseless and has stood the test of ages by that race of hunters, the American Indians, who originated also the camp, trail, snow-shoe and canoe. One is, when equipped with them, more certain in carrying a pack, he is not so apt to turn the ankle, and the whole musculature of the foot is brought into play which is a great desideratum in precarious climbing.

Of materials moosehide is popularly associated with moccasins. It does not pretend to be waterproof but it is very durable and provides the softest, lightest, and most comfortable footwear made. A pair weighs but a few

ounces and rolls up in a small compass, so an extra pair can be nicely tucked away in a corner of the pack. Even if a man wears shoes during the day a pair of moccasins should be taken along for a restful change of wear about the evening camp fire. Moosehide and elkskin are at present hard to procure hence the names are mainly trade terms. Discriminating sportsmen can get the genuine moosehide cruising packs from the Putnam Company, Minneapolis. For our purpose the oil tanned pack of cowhide is more easily procurable and superior for general use to the moosehide article. It can be kept pliable and a semblance to being waterproof by the application of animal oils.

The shoe-pack is a boot shaped like a moccasin but with a higher top. Either is preferable to a shoe for tramping because of their lightness and softness to the feet. The upper should be high enough to make the total pack height about ten inches.

No matter what footwear you choose you should provide for the wearing of one or two pairs of heavy wool socks into whose tops are tucked the pants leg, thus doing away with leggings. This may sound paradoxical to the tenderfoot. The idea of housing the feet in summertime in heavy wool socks! The notion

nevertheless is based on experience. The thick are no hotter on the feet than the thin. It is the leather that keeps the heat in. Wool equalizes the moisture evaporation. If your work forces you into wet places the temperature is modified. One can fish standing in very cold water and not suffer. A sportsman can spend several weeks in an almost normal condition of wet feet without suffering, even in mild fall weather, since his wool socks keep his feet warm in spite of the wet and cold. Where one perspires freely on dry tramping the perspiration is taken up from the skin and transmitted by the wool fibers to the outside of the sock where it is more easily evaporated.

In the coldest weather the feet are always warm when covered with heavy wool socks and moccasins and it is the only successful combination for use in snowshoes. For common tramping they are ideal, for the constant exposure of the feet to the wet is to be anticipated and the thickness of the wool softens the shock and pressure of foot work on rough trails, diminishing the danger of friction and impact. In fitting shoes or moccasins over your heavy wool socks allow a half size larger in length and two letters in width over your street shoe. Even then your foot covering will

be about three times the bulk of your tight fashion-plate town footwear.

The life of a good fitting, light weight wool sock worn with a good fitting shoe is about 75 to 100 road miles or about a week's wear in constant marching under ordinary conditions. Whenever the softness of wool is lost because of frequent washings discard them. Weston wears a natural gray wool sock undyed.

Never start on a long hike with unbroken shoes. A quick way to break them in rather than subject the tender feet to the trying ordeal is to follow the plan of the United States Army as follows: Wearing the shoes over wool socks stand in three inches of warm water for five minutes until the leather is soft and pliable, then walk on a level surface for an hour or until the shoes dry on the feet, to the shape of which the pressure of the body weight and muscular action have forced the leather, in drying, to conform. They will then be as comfortable as old shoes.

The one feature of shoe selection which seems to appeal to the average sportsman is waterproofing. He will allow his sane ideas of size, shape, weight and durability to run riot if only the salesman can prove his assertions of the waterproof qualities of the item at

hand. It happens to be well nigh impossible to make leather really waterproof. If one succeeds in impregnating the tanned skin with some water repelling application the seams are apt to leak in worn shoes and the leather treatment goes for naught. In fact waterproof footwear is just the condition the tramper does *not* want. In the first place it is a sin to encase a perspiring foot in a shoe which retains all the effete matter of perspiration which will soften and weaken the skin. There may be conditions of wet snow where absolute dryness of the feet is paramount but then one had best get the regular rubber overshoe. All that we should expect of leather is that it will be impervious to water sufficiently so as not to soak it up like a sponge. Wet feet won't hurt you but hot and sore feet always do; an occasional wet foot is far better than a continual sweaty damp foot.

Moosehide at best is not water repellent and is good for dry trails and dry snow work because of its porosity. Oil tanned calfskin shoes and moccasins are the best. They should be kept soft and supple by the use of one of the various dressings on the market or one compounded at home. Perhaps nothing beats pure neatsfoot oil for leather dressing. It is a nat-

ural animal oil free from acids and other substances deleterious to leather life. It is the chief ingredient of many of the shoe greases and waxes of commerce and is cheap and universally procurable. It should be applied with the finger tips on the dried warm leather, rubbing it carefully into seams, stitch holes, and threads to prevent their rotting. The French Army dressing is composed of neatsfoot oil 7 parts, and mutton tallow 3 parts. These heavier dressings interfere with the evaporation of the perspiration causing the feet to sweat in warm weather.

In drying wet shoes never place near a fire for this will result in a hardening of the leather. It is better to heat oats or gravel and fill the shoes to absorb the dampness. Moccasins can be stuffed with dry browse of any kind or inverted over stakes driven in the ground not too near the camp fire.

The pack should contain a ditty bag with a simple footwear repair outfit. For leather working take along a light weight awl, sailmaker's needles and waxed thread with perhaps a repair patch of leather or rawhide. Customarily after long use of shoes or moccasins the threads break or wear away leaving seam leaks and one must be prepared to remedy

them. They will be found especially around the vamp at the toe and the "T" heel joint. Clean out the old stitch holes back to where the twine is sound and start your repair seam a couple of stitches back of this.

CHAPTER VII

EFFICIENT CRUISING SHELTERS

AT night the novice wants to be housed in and the mysteries of darkness shut out, and as is becoming with precedent in outdoor living he must spread his blanket beneath cloth. This shelter can be very simple indeed and yet protect one from the elements. A tent's sufficiency to turn water is not all that is necessary. Upon means of transportation and permanency of the camp depend the portability and lightness of the forest home. What will do in a permanent camp with plenty of transportation is a far cry from the tent just sufficing the absolute needs of the one-nighter who expects little more than mere shelter and warmth.

The shelter must be waterproof and on a hike trip be the extreme in lightness and compactness for the sake of easy carrying. Light weight tents of clever design can now be secured from any outfitter; or tent making at home is feasible and offers so much opportunity for the expression of individual ideas that

sooner or later the outdoor man will try a hand at fashioning the ideal shelter. Exclusively for the use of the hiker the simplest of tent forms will answer.

THE SHELTER CLOTH

A rectangular piece of sheeting of fine texture, size 7 by 9 feet and waterproofed by the paraffine process will serve very well as a roof, pitched leanto style or stretched over rope ridge or poles as a wedge or "A" tent. Its ends may be closed by thatching with browse and a cozy fire built in front. It makes the simplest cloth shelter known and the cloth has a variety of uses such as a poncho, pack cloth, floor cloth or sleeping bag cover. Going a step farther in construction one can make the ends also of cloth and then one has a regular leanto whose principles of construction are as old as the hills whence it originated. There is no more efficient cloth shelter for all kinds of weather no matter how elaborately it may be constructed.

One must not regard the shelter feature of the leanto as its chief recommendation for its adaptability to perfect heating puts it above any other tent. The old fashioned reflecting bread baker of our forefathers which was set up near the open flames of the fire place was an

efficient appliance and one which is again coming into popularity to replace the Dutch oven and ash cake methods of baking. The work is done by the reflecting surfaces — the angles of the top and bottom throwing the heat to the middle. This same principle is employed in the shelter tent however with only one reflecting surface (the slanting roof) throwing the heat from the front fire directly onto the bed. Other advantages of the tent are: — its lightness and its availability for use as a general pack cloth about camp or on the trail. It is the best tent for snow work and wintering if one is driven to a cloth contrivance at all at this time of the year without a stove.

The shelter cloth may be slung at any angle and best by means of a rope ridge thus saving pole cutting. The corners are staked out, using two-foot pegs which are pointed with a sharp axe. With the open side pitched to leeward one gets perfect ventilation and warmth. A rousing fire is required and one for all night means hard labor since many large logs are necessary for use on a chilly night. Since so much wood is necessary naturally this type is best adapted to wooded districts. In the woods dampness is nearly always present even in summer days. This probably does not al-

ways lower the temperature so much as it increases the humidity of the air. Build the fire with the back log reflector, placing it about four to six feet from the tent opening. Heat intensity lessens, the greater the distance between the fire and the tent.

In mosquito infested districts a loose cheesecloth front can be attached to the open side and again removed in cold weather to allow heat to be better reflected within and affording a cheerful view of the leaping flames. Two leanto shelters may be at any time joined ridge to ridge and thus used as a wedge tent. To close the ridge of such a combination one must have an eight inch drop cloth extending along one ridge to cover the opposite ridge section. They can thus be at any time separated and used as leantos.

In making the leanto at home the lightest material should be used. The advent of so-called balloon silk has revolutionized tent making and using it has made possible a better outdoor home where weight is the main consideration. It may be dyed an emerald or the popular khaki color either of which is restful to the eye and is inconspicuous alike to human and insect visitors. After being made into the desired tent form it can then be waterproofed by

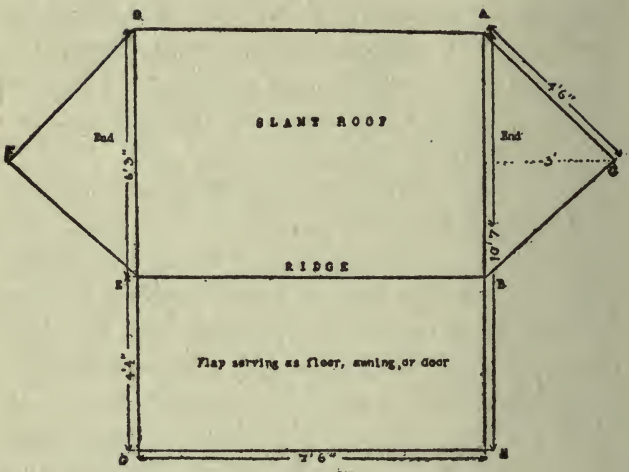


FIG. 1.

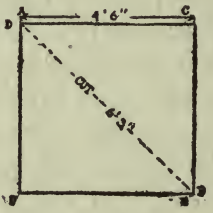


FIG. 2.— Diagram for Ends

CLOSED LEANTO OR BAKER TENT

either the alum and lead or the paraffin process. The lines of stress in a tent lead from the points of suspension and these should be strengthened by tapes sewed on.

MAKING THE CLOSED LEANTO OR BAKER TENT

By attaching a flap along the ridge of the leanto the shelter may be made into a closed tent or extended out in front at the height of the ridge furnishing an admirable awning. Further by reversing the pitching so that the ridge extends from A to D the flap serves as a floor. Waterproof balloon silk may be purchased in thirty-eight inch widths and of it one will need twelve yards to form the closed leanto whose length will be seven and one-fourth feet, height four and one-fourth feet, and depth four and one-fourth feet. It will weigh around three and one-fourth pounds.

First you sew a rectangle seven feet six inches by ten feet seven inches. See Fig. 1. We have here given oversize measurements to allow for an overlap of one-half inch or so at the seams. At the ridge E–B reinforce with tape or cloth and use two inches of the rectangle to sew over a rope ridge from B to E. The ends, Fig. 2, are made from a square four

feet six inches by four feet six inches and then cut from the corner A to corner B. Thus A–B, Fig. 2, is sewn to A–B, Fig. 1 and D–E, Fig. 2 to D–E, Fig. 1. The edges of the whole tent are turned under and reinforced by a one-half inch white tape. At suitable intervals tie tapes are sewn around the tent edges to facilitate an attachment to ground pegs and in the adjustment of the flap.

THE TARPAULIN TENT

A piece of cloth eight by twelve feet will furnish a remarkable variety of tent forms and shelter devices from a leanto to the closed style. It is the best bivouac for rain and mosquitoes. Aside from its simplicity in shape and handiness in construction, it has, if made from the proper materials, an added advantage of lightness and is ideal for use as a general utility camp cloth. No other style of tent will furnish so much head and sleeping room for the same weight and area of cloth.

In making one at home procure four yards of unbleached muslin of ninety inch width (or twelve yards of the thirty inch width), dye it the shade of color desired, and use it to make the tent and then waterproof it. Cut and sew the pieces into the 8 by 12 sheet and make

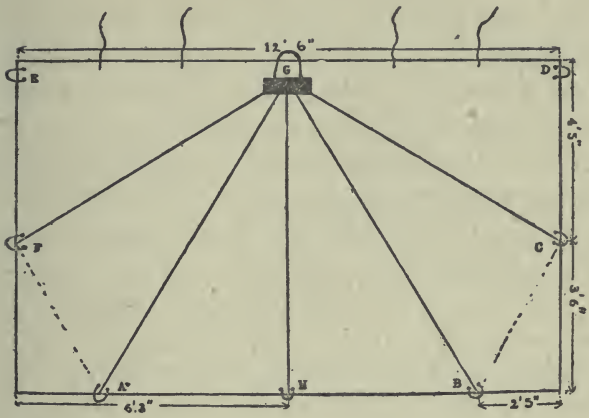
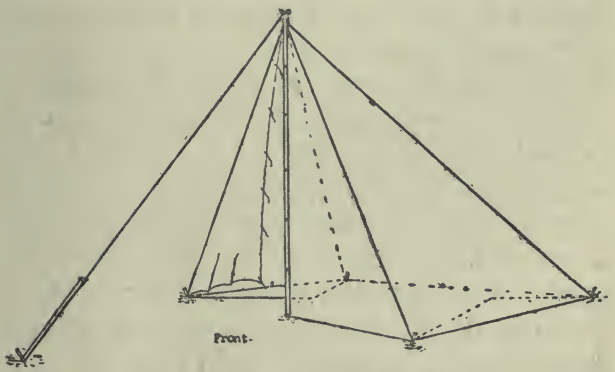


DIAGRAM OF TARPAULIN TENT



TARPAULIN TENT ERECTED

around the edge a ¾ inch hem. Lay it flat and with chalk or a pencil mark the lines as diagramed. For reinforcement sew on light tape from the points a, b, h, c and f as indicated and converging all at G where a semicircle of the tent material is sewed in and a strong cord loop is attached to the grommet in the peak. This suspension point will receive the greatest stress when the tent is pitched. Upon this tape reinforcement depends the strength more than the kind of cloth used. Make peg loops at e, d, f, a, h, b, and c. The back of the tent will extend from a to b, the sides f to a and b, to c and the front e to d with the apex at G. The holes are protected with grommets procured from the tent shop or hardware store and the cloth reinforced by 3 by 3 inch squares sewed in.

The tarpaulin used as a flat front tent, as a leanto or as an open shelter tent can be erected in a few minutes. To set up — the corners are first pegged down at A and B stretching the rear line snugly: carry the sides B and C and F and A to the point S at right angles to the rear line and peg down. Throw the suspension rope (5 yards of braided window sash cord) attached to the loop at G over a projecting limb or pole and pull taut. This

rope should continue the angle of the roof from H to G and the front e, f, g and c, d, g, is perpendicular. A sod cloth may be sewed around the floor or a permanent floor cloth fitted in. In mosquito season a loose cheese cloth door may be attached. The dimensions of this useful tent when pitched are height 6½ feet, depth 5 feet, and width 7½ feet and when constructed of balloon silk need not exceed a weight of six pounds.

The tarpaulin tent inherits various salient features of worthy forebears — the teepee's peak, the roof angle of the A tent, also the pyramid or miner's, its front is a suggestion of the wall tent, while the open camp feature reminds us of the leanto with its broad sloping back wall which reflects heat on cold nights.

The tarpaulin used as an open faced tent is a compromise between a wedge and a cone tent. It lessens the height but gives more floor space. Peg down a and b as usual, then f and c somewhat at a distance and at an obtuse angle to the back and the front flaps out from the center.

The tarpaulin used as a leanto tent is easily erected by pegging down the corners E and D and suspending the opposite edge at an angle of 45 degrees as a ridge. Build your fire in

front. For additional protection put poles, brush, etc., at the ends of the shelter.

Of materials preferable for use in light weight tent-making waterproofed balloon silk stands in a class by itself. Superseding the antiquated duck or flimsy drill tents it is one of the items which has done much to make tramping trips feasible and worth while. It is in reality not a silk at all but a closely woven cotton cloth with a weight of but 3⅗ ounces per square yard (12 ounce duck waterproofed tips the scales at about 16 ounces). It is waterproof, rot proof, mildew proof and exceedingly durable. A leanto for the bivouacker can then be kept down to three pounds.

Other colors than white are recommended for tents. Khaki is popular because it blends with the color scheme of the woods and plains and is restful to the eyes in the sun and cool on a hot day. A khaki colored waterproof silk is marketed as Tantalite. Should one prefer a cloth of green color he should get the so-called Emeralite. Neither one is so conducive to the collection of flies and other insects nor so noticeable in the woods as white. None of these cloths soak up water, hence if packed away after a rainy spell they do not appreciably burden the pack. Tents of most any desired

shape can be secured ready made from any of the above materials.

Should one want to attempt tent making at home he should get the so-called Egyptian sail cloth or Number XXX muslin and after making it up into the desired tent form waterproof it by one of the methods hereafter described.

WATERPROOFING METHODS

Upon touching a tent roof during a rain it will in most cases begin to leak. Processing to make it waterproof will avail little if the right cloth is not used in the first place. Say you are making a so-called silk tent using muslin. There are several grades and weaves on the market some being loosely woven and they soak up water like cheesecloth. So get it of the tightest weave and by impregnating the fibers with a waterproofing solution they are enveloped by the water repellent mixture and the interstices are not large enough to let the water through. The proper closely woven muslin cannot be secured in the average town store but by perseverance can be purchased from the city department stores.

Waterproofing by paraffin is a most satisfactory process and the one most used by tent manufacturers. True the cloth is thereby stif-

fened in cold weather but it is absolutely waterproof and the method of application is easy. Simply put into a tin vessel 3 pounds of paraffin shavings (ordinary paraffin of the stores) and two gallons of gasolene or turpentine. The receptacle, best with a closed top, is set in the sun or in a tub of boiling water and never near a flame. When a solution is effected outdoors spread it on the stretched cloth by means of a brush, sponge or piece of cheesecloth. The gasolene evaporates leaving a thin coating of paraffin in the fibers of the cloth.

Such coloring as you may desire to apply to the cloth must be done before the waterproofing process for thereafter the fibers will not take up a dye solution.

To make it fire proof and rot proof as well as water repellent I would treat the cloth first to an alum and sugar of lead solution and then paraffin well as above. Fireproof cloth is nearly as desirable as waterproofing. Many camps have been burned by sparks falling on the tent roof which was rendered very dry by the heat of the nearby camp fire. A spark falling on a properly treated tent roof burns only a little round hole at the worst.

The alum and sugar of lead solution is made thus: — 4 ounces of alum and 10 ounces of

lime are added to 10 quarts of water and the tent immersed overnight. In the morning it is rinsed in lukewarm rainwater and dried in the sun. The fibers of the cloth are filled with an insoluble solution of lead acetate and alum and is rendered efficiently fire and water proof.

THE EMERGENCY BIVOUAC

No man knows what he can do outdoors until he has tried it personally. The shifty man caught homeless in the woods will make some sort of shelter for himself out of anything at hand as slats, boards, bark, boughs, sod, poles, dirt or whatever is available. At no stage of the camper's game can one display his ability to utilize woodcraft as he can in building the emergency bivouac.

Wherever one goes matches, knife, and axe should always accompany him. With these he is ready for preparing a windproof and as far as possible a weather proof shelter to secure necessary warmth no matter where he may be caught out.

A simple tree shelter is provided by selecting a small evergreen, cutting partially through the trunk at a point 4 to 5 feet from the ground so that in falling the butt remains attached to the stump. On the ground side cut away all limbs

and branches for this is to be your roof. The upstanding limbs on the outside may also be partly cut and so bent over as to further enhance the value of the roof. The browse laying about is then collected and thatched on the ground for a bed. The ends may be enclosed by the addition of other trees — poles, browse, etc., roughly thatched to serve as a wind break.

A leanto of poles, covered with bark or browse, makes a handy shelter for a little emergency camp. Select a big boulder and lay against it four poles sticking the pointed butt ends firmly in the ground. If no boulder is available fasten horizontally a pole between two trees to lean the slanting roof poles upon or support it by two upright poles with forks. Lean against the cross pole enough other poles to form a rough roof with proper pitch which must be steep if the weather is bad. Thatch with browse like shingles or simply lay on pine or hemlock branches. These fans always grow close to the ground on young hemlocks and with an axe a big pile may be secured in a few minutes. A shelter cloth of course comes in handy here. Cover the floor with boughs. The ends may be closed similarly. A good log is laid on the outer edge of the bed. In winter

such a thatching if covered with snow supplies a warm shelter. Before the open front build a reflector and a fire, and you can enjoy a cozy camp.

CHAPTER VIII

CAMP MAKING

WITNESS the conduct of the seasoned woods traveler. His camp comfort is ever uppermost in his mind and although with meager outfit he so employs the artifices of woodcraft that his nights are spent in pleasant surroundings and refreshing sleep.

After the day's tramp he must get a warm meal and into comfortable repose as soon as possible. Hence toward evening he chooses a suitable camp site near good drinking water. The latter is often of questionable quality and yet of considerable importance from the point of view of health. If in doubt about its purity boil the drinking water for half an hour, cool and strain through cotton or cloth. Most mountain streams are pure. Caution is especially necessary in regions where stagnation and germ life are prevalent, in valleys where camping parties or inhabitants have contaminated the watershed or where the water has flowed over poisonous mineral deposits.

If on a fishing trip the nearer the camper is to the trout stream the better, if on a shooting foray his field for selecting a site is greatly broadened. He must look out to be near plenty of firewood and leanto material.

The exact spot where one's bed is to rest and shelter erected should be on a slight elevation where the ground is dry and which falls away from the tent on all sides, providing perfect drainage in possible wet weather. A windbreak of heavy tree growth is desirable but never get near trees that may blow down in a storm.

Now go about pitching the tent, placing it so the entrance will be to leeward of the prevailing winds; avoid these by keeping away from the high hills. Select two trees ten feet apart with a flat place between and proceed to level the tent floor by removing browse and rocks, smoothing dirt mounds, etc. Now proceed to make your shelter which may of necessity be the Indian emergency bivouac or the shelter cloth camp. (See chapter 7 "Efficient Cruising Shelters.")

Next clear a living space in front of the tent providing room for the fire. In no way does the camping tyro proclaim his greenness more than when he attempts to make a fire. The

white man nearly always builds a fire of a size that is out of all proportion to his needs while an Indian usually builds a very small fire — a habit acquired possibly from his former necessity of concealing his whereabouts from possible enemies but probably because of his good sense in woodcraft in doing only those things which are really necessary. A good knowledge of fire building is always essential for the preparation of meals and for night heating purposes. We must master, in keeping with the above needs, the making of the small cooking fire and the larger " friendship " or night fire for warmth.

THE COOKING FIRE

The cooking fire should be made quite systematically and quite apart from the heater. If one simply wishes to boil a pot of water or toast a piece of bacon the fire may be made of small material such as dry short twigs picked from a standing tree. For the regulation cooking fire it should be kept so small that one can approach without having his eyebrows singed. There is no need to have a lot of flames but replenish often and keep it going steadily, thus forming a good bed of coals to send heat in all directions.

Several methods are used for supporting the cooking utensils over the fire: — (a) dig an earthen trench 6 inches deep and slightly narrower than the fry pan bottom. Along either side lay a 3 foot small green pole and build the fire between. The pan and kettle may rest on these poles or may be suspended by hooks attached to a dingle stick whose other sharpened end is thrust in the ground at a slight distance and pressed to slant over the fire. Again they may be attached by crotched sticks from a cross pole which rests in notched stakes driven in the ground at either end and at a proper height from the fire. (b) A couple of small green logs, hewn flat on top, laid five inches apart and pegged into place to prevent rolling, are also serviceable. At one end the distance between logs may be widened to accommodate the different sized utensils. Flat stones may be used to build the little fireplace. If your fire does not draw well you can raise one end of a log a little off the ground by putting a small stick thereunder. Wait until the fire of clear wood has burned down to coals and then cut off your draft and cook over the coals, using the log supports as though they were a range. Your cooking fire is little larger than your hat and throws off very little if any smoke.

THE FRIENDSHIP FIRE FOR WARMTH

This is the heater for comfort as you while away the evening in cheerful reminiscence of the day's happenings, as you watch the lurking mysteries of night approach, and which will warm you before you roll in fluffy blankets for the night's repose.

The fire for heat must needs be larger than the cooking, yet too big a roaring fire is what you don't want. Something moderate which will be safe in a change of wind and which will throw heat into the tent will be found adequate. To enhance its value one should build the night fire before a reflector which borrows the principles of the old fashioned fireplace for throwing heat forward. It is located about six feet in front of the tent's entrance and may be composed simply of a big boulder, a small flat faced cliff or a regularly made wall of green logs.

In making the log reflector cut two stout stakes long enough to project three feet above the ground after they have been driven down sufficiently to hold well, placing them one yard apart with their protruding ends slanting away from the tent. Now take a four foot green log, say a foot thick, and place on the ground

against the stakes. Pile upon this three logs of lesser diameter, the difference in size will hold them in place. Then cut two short green logs to act as fire dogs and place them on the ground end on against the back log reflector. Across these lay several dry logs for burning, put your small starting twigs or trash stuff beneath and ignite.

In building a fire secure, if possible, for kindling the bark of the birch which is easily accessible if one goes to the North woods where most camping is done. It is torn in strips and rubbed dry to a fray. In other regions you will be driven to the use of dry grass or other highly inflammable material. Over this put twigs or the choppings from the cores of dead trees, laying them in pyramidal shape with open air spaces within. Now touch off the pile with one of the matches which you have been careful to pack in a waterproof matchbox. When well aflame put on carefully the branches of successively larger sized sticks allowing plenty of air supply to the flames.

In wet weather the task of the inexperienced fire maker is more difficult unless he is well supplied with birch bark which has plenty of oil in it. Without the bark one must get enough fine shavings of the dry insides of de-

caying logs and pile them up and carefully add small fuel as needed.

For larger fires purely for heating purposes start a small fire and add larger wood until you get the big blaze which will then likely consume even wet wood. It is important to know what kind of wood to choose for fuel. In general standing dead timber is always drier than down timber. You may be surprised at the good wood one can garner from dead stumps which are decayed on the outside but have a sound core which splits easily and burns to perfection. Always use these woods in preference to a growing tree.

One unfailing sign of the good camper is his use of just as little wood as is possible. It should be gathered before night and placed near the shelter.

In the woods always be careful about spreading fire, a forest fire may result and destroy not only the camp but your hunting and camping grounds and deprive others of their rightful enjoyments and heritage. Such carelessness is considered a crime among woodsmen and in some states is a direct violation of the law. Bear in mind several simple rules for fire prevention: — never throw a match in dry leaves: never leave a fire burning when there is no one

to watch it, for a gust of wind may start a bad fire from a bed of half dead embers. In locating camp always build the camp fire in the open if possible or on sand or soil but never on forest loam. Note the direction of the wind and try to build the fire just to windward of a brook, road or green grassy plat which would act as natural barriers to a spreading conflagration. In fighting fire, pour water on the flames themselves, soak it, drown it or cover with earth. If the ground is of loam or peaty nature souse it also. If it is spreading use boughs dipped in water to beat flames with or use a wet blanket or even a shirt if necessary rather than let the fire leap from your control.

Having properly started your cooking fire you are now ready to unpack the grub bags. The cook kit is to be rinsed out well, the kettle filled with water and put over the fire; fill the fry pan with meat ration and start your batter for cakes. At the conclusion of the meal clean up the dishes at once so that the hours of relaxation before sleep may be unharassed by the drugery of undone scullion's work. The dishes are wiped with tufts of grass, washed in clear water and thoroughly dried before the fire.

CHAPTER IX

THE OUTDOOR BED QUESTION

TO one who has never done any camping the choice of a bed is one that nettles him and he will have doubts about being comfortable with the outfits recommended by those of experience. Upon no article of wilderness equipment is there so much diversity of opinion expressed nor upon which more experimentation is lavished by the average enthusiast than the camp bed. From the cumbersome bedstead of civilization to the necessarily extremely portable bed of the movable camp is a far cry. In spite of all experiences the latter is found to be best patterned after principles of the former. Just the method of adaptation is the problem that confronts us.

The tenderfoot styles himself a woodsman by displaying willingness to sleep on a poorly prepared bed, even boasting of the smallness and lightness of this part of his outfit. He is out to "rough it," you know. The seasoned

campaigner on the other hand prides himself on the comfort of his nightly abode. The native Indian can and often does sleep on a hard bed and you can simulate him when you are accustomed to it but probably you will not have the time to get used to this on the short vacation you will have.

A man may abuse his physical powers by day in the most exhausting work. He can go into the wilderness expecting to pay small attention to a comfortable and rejuvenating night's rest but he can not stand up under it. One can make out for a few hours on most any kind of makeshift for a bed if his sleep is from exhaustion but sooner or later he will be disturbed by the inequalities of the earth's surface, rocks, sticks and mounds, and when awake his muscles will be stiff and sore, his powers unrefreshed and he will soon go to pieces.

A good bed is no disgrace. The men who are obliged to live out of doors all the time, on the range or forest trails are likely to be the very ones most particular about their beds and to see some of them at work on browse bunk and rude shelter one would believe they were preparing to spend the rest of their days in that particular spot. So no matter how light you travel provide for a suitable night's rest.

Should your fastidiousness lead you to add any foible to the already completed pack let it be on this essential item of wilderness equipment.

By careful choice the bed need not be cumbersome to pack and yet be ample to satisfy all needs. It should protect the sleeper from the cold which is greatest near the tent's floor and from the winds whose greatest force is spent when it contends against the properly pitched shelter overhead. Provision must be made for keeping the bedding off the ground and for allowing an egress of moisture in the summer and a retention of heat in winter. One has a variety of styles to choose from, ranging from sleeping on the warmed bare ground to luxuriating on the latest invention for creature comfort when camping — the combined pneumatic mattress and blanket bag.

In all likelihood you will depend for warmth upon blankets. Their use is so universal that we need no discussion other than in regard to their quality and shape. As commonly used a blanket bed throws open easily; there is no condensation of moisture and the sleeper is able to wrap up snugly, retaining all of the generated animal heat. Lambs' wool fibers are peculiar in that they have a natural repulsion for water. They have the attribute of hold-

ing air in the interstices between the fibers, thus creating a dead air space which is a nonconductor of heat. On account of these things wool becomes ideal for body covering. Damp wool will not chill, which condition the outer is often up against many times a day. In summer the evaporation of surplus moisture and in winter the retention of animal heat is obtained. The thicker and looser the texture of woolen goods the greater will be the warmth.

Cotton is objectionable because it is not warm and is in danger of being "fired" from stray camp fire sparks. The wool of the South American llama is a new material used for outing purposes and besides having all the good attributes of lamb's wool has an additional one of being very much lighter in weight. A llama blanket weighs about six pounds and equals in warmth about fifteen pounds of ordinary blanket. The secret of its warmth is in the great number of air cells between the loose texture of its fibers which retain body heat. At the same time it gets rid of the moisture which the sleeper throws off in great quantities as natural body emanations. Its prohibitive cost will prevent its general adoption.

Eiderdown in no way equalizes temperatures. It simply retains moisture and heat and

is too warm except on the coldest nights. Usually in the form of a quilt whose outer cloth covering tears easily the fluffy down is hard to control. It is of little use beneath the sleeper because the pressure squeezes out the confined air.

The blanket as well as the union suit then had best be all wool of the domestic lamb variety. In buying blankets beware that many of those offered you may be humbug. See to it that you get an article made up of curly wool fibers and not "adulterated" by the straight cotton kind — a differentiation easily determined by the aid of a small magnifying glass. Also see to it that the weight is in the thickness and not in the size. In this country the regulation Army blanket is to be depended upon. However, if they can be secured, a person will certainly make no mistake in getting a genuine Hudson Bay or Mackinaw. The proper weight is about five pounds per blanket and size seventy-two by seventy-eight is about right. If you get it too narrow you cannot then roll it up so snugly for packing nor wrap it so closely about the body at night.

The number of blankets needed depends somewhat upon the time of year and the locality of use and whether or not the all night

fire is to be used. In ordinary summer weather one blanket is enough especially if combined with the proper browse bag and wind break and is enough even for frosty autumn temperatures up to stream freezing time, excepting in the higher altitudes. With the temperature under thirty-two degrees two Army blankets will be needed.

Many mountaineers to whom strenuous pedestrianism and cold nights of the higher altitudes necessitate the lightest form of bedding prefer wool quilts which are folded and sewed on one end and half up one side in the form of a sleeping bag which is protected from the damp ground by a waterproof balloon silk cover.

Where the transportation is inadequate as on a hike trip, the wearing of an extra suit of underwear is as warm as an extra blanket. One then gets the dead air space between the wool and the warmth is thereby intensified because the number of layers of covering retains the heat longer than one thick layer of the same weight.

In Arctic work the clothing and bed cover must be chosen with one particular fact in mind — that moisture condensation from the body perspiration or from accidental immersion in

water must be eliminated, otherwise ice will form to the detriment of the individual. Any woven fabric will hold condensation while fur will not. Fur then is the clothing and bed cover of choice where one is exposed to extremes in cold. The fur should be worn with the hair outside the same way that the animals wear it, otherwise it is too hot. The best fur is caribou skin and it is warmer and lighter than a blanket of wool. Llama wool is next best.

Very satisfactory fur robes may be made of the rabbit or cat skin and if made after the following method you will have the warmest bed fabric known to man. The skins are tanned by soaking the "green" hides in running water for one to four hours. Then the flesh and fat is peeled off with a dull knife and the skin soaked for two days in a tan liquor of sulphuric acid (*poison*) one ounce, salt one quart and water one gallon contained in an earthen jar. Rinse the skin in clear water, dry and when partly dried work well in the hands thus breaking up the fibers to keep it soft.

The tanned and softened skin is now cut into long strips one-fourth of an inch wide, which are tied or sewed together, each strip being twisted so that the fur stands out all around the hide thong. These strips are then interbraided

into a loose web in a frame the size your blanket is to be. The chief objection to this article is that it is heavy and the fur sheds a good deal so it is best to cover the blanket with light cloth which of course adds some weight without giving any additional warmth. A full sized rabbit robe weighs ten pounds and is warmer than many blankets of wool. The secret of its warmth is the dead air interspaces between the fibers.

There is considerable difference of opinion among woodsmen regarding the choice between the sleeping bag and blanket bed. There are good arguments for and against. As usually made a sleeping bag consists of two parts:—(1) a cover for protection from rain, dampness, and wind, and (2) a warm lining to retain body heat. To its credit may be enumerated these facts: Being sack-like the sleeping bag retains the heat within and keeps the cold out. It is easy to unroll, keeps out dirt and wind and the contents may remain dry and one has full protection in any kind of weather.

The objectionable feature is that the bag cannot be drawn up closely to the body and the resulting air space is difficult to warm up. It is hard to adjust the top to keep the air from the sleeper's shoulders and the inevitable twist-

ing and turning of the sleeper bunches the blanket up around the limbs.

A sleeping bag really is no substitute for a roof overhead on a rainy night as alluring advertisements would lead you to believe. Its waterproof cover retains inside moisture from the air and the body exudations of the sleeper thereby adding appreciably to the blanket's weight. Thus a waterproof cover is no more wholesome to sleep in than a rubber boot is wholesome for one's foot. In ordinary weather the sleeping bag is too hot and in chilly weather it is not as warm as it is supposed to be. Its narrow shape makes it difficult to crawl into the head end and it is very inconvenient should one need to get up several times a night to fix a night fire.

It is an unpleasant trap to be in when a squall springs up suddenly at night or the tent catches fire. No less famous an explorer than Peary discarded the sleeping bag for the reason that, aside from its being a weighty extra item of outfit, when sleeping in snow igloos he was in constant danger of a break in the icy floor from the formation of pressure ridges and if encumbered in the bag he would have extricated himself with difficulty. Quoting Mr. Harry Whitney — "On my winter ox hunt I

started into the Barren Grounds with a bag of caribou and lined with rabbit skin — the very warmest robe possible, but I ripped it open before I had been on the road three days."

The choice between a loose blanket bed and the sleeping bag is a matter of individual preference. If the latter is chosen it should be made to air easily and be easy of adjustment to varying temperatures. The permanently closed bag is out of the question as it retains the accumulated condensed body moisture. The only kind worth considering is one which can be easily opened and spread wide apart in the sunlight or before a fire every morning. The bag should be closed on all sides as far up as the breast of the sleeper and the continuation of the bag in the shape of a flap which can be nicely tucked about the shoulders.

Probably the best low temperature sleeping bag is of caribou skin with the hair inside. One lined with llama wool duffle is next best. The so-called Arctic or Fiala sleeping bag is the lightest one available from outfitters in the United States. If one prefers this kind of a bed the tramper can find nothing so excellent where the greatest amount of warmth with the lightest possible weight is imperative.

Made of the soft body wool of the South

American llama it is about twice as light as any other wool of equal thickness. As sold by many outfitters the cloth cover is waterproof but this should not be. To get the greatest warmth it is necessary to have not only the blanket porous but the covering as well so as to throw off the moisture which otherwise condenses and chills the occupant of the bag. But the sleeper must be insulated from the ground's cold, moisture, and wet and hence the waterproof browse bag or thatched balsam bed used under the sleeping bag is recommended. Any blanket combination can be made into a serviceable sleeping bag by folding lengthwise and securing one end and three-fourths of one side by blanket pins or by sewing.

You will of course not carry a mattress with you on the hike yet it is really necessary that you have some sort of browse thatching, waterproof sheet or pad to insulate you from the bare ground. The bed springs par excellence of the woods are of thatched evergreen boughs or balsam. This, the trapper's bough bed, is largely poetical with campers in sections of the country where balsam, hemlock or spruce are not available. It is difficult to make but when properly constructed furnishes a mighty comfortable place to lay tired muscles at night.

Collect a heap of boughs " about the size of a small house," according to Moody, stripping off the fans with the hands, using only the lighter tips. Build on the ground a quadrangle of poles somewhat larger than the intended bed and retain this in place by ground stakes. Beginning at the head lay your larger fans convex side up and butts toward the foot much as you would shingle a house with the bushy stems overlapping. Over these lay a similar cover of the smaller fans with the butt ends beneath the layer already placed, leaving the fan ends curving up and down toward the foot of the bed. When done place over all the floorcloth and blankets. As the boughs get pressed down and the bed becomes hard they must be replenished.

The ground cloth is to a tent what a floor is to a house. It keeps out dirt, vermin, dampness and wind and in cold or wet weather, besides being an absolute health necessity, it will add greatly to one's comfort.

The ground beneath besides being wet and cold is hard as a board for sleeping purposes, hence some sort of pad is needed. Nothing meets this requirement so well as the so-called browse bag or tick. It is preferably made of waterproof balloon silk or paraffined muslin (a

rubber blanket or poncho is too heavy) size 2½ by 6½ feet and weight 1 pound. It is open at the foot end and at each camp is stuffed with hay, grass, leaves or other browse dry or wet. The bag weighs but little, takes up small compass when rolled for the pack and is useful in packing. It is quickly made into an acceptable bed mattress each night and emptied each morning.

With the filled browse bag beneath you the under side is always dry and warm and the upper side is attended to by rolling yourself up in the blanket. For traveling through a rough swampy country and for mountain work this is absolutely necessary for a restful sleep.

The bag may be composed of a 7 by 8 foot sheet with grommets 3 inches apart on one end and the sides and when not serving day duty as a pack cloth or in the emergency bivouac as a tarpaulin leanto shelter tent may be worn like a Mexican serape or rain blanket over the shoulders. It can be made into a browse bag by folding the sides together and lacing the ends and side with a string of number 36 tarpon line. Or the tarp or shelter cloth may be laid over a collected layer of browse next to the ground. With a browse bag one can rig up a good bed

pad in much less time than it takes to shingle browse.

To sleep warm outdoors the ground should be as dry and warm as possible. This can be accomplished if need be by a fire built over the intended bed area, the embers raked away and the bed made thereon. The browse bag is then filled and flattened over the heated spot. There is some knack in arranging your covers about you to fit snugly and keep out the night cold. It can be done by a simple trick so as to entirely eliminate the necessity of a sleeping bag.

Lying flat on your back on the browse bag cover yourself with the blanket, kick up your feet rigid from the hips so as to bring the blanket foot end draping over and under the feet, returning the feet to the tick roll the body to the left side and tuck the blanket edge under your right side, reverse the turn and do the same under your left side. Lower the feet, wrap up the shoulders and go to sleep. The blanket is now drawn about you snugly above and below and there is no exposed side to let in the cold air and in rolling over the blanket will tighten about you.

In an emergency one can sleep in most any kind of weather by following a certain Indian

method. He carries but one blanket but does not use it to wrap around his body. If the night is not too cold he lights a rather large fire and warms the earth, then he rakes away the coals and lies upon the bare warmed ground pulling the blanket over him. In extreme cold in addition to the above ground warming he heats a large stone before bedtime, rolls it on the ground, curls himself around the mound, and pulls the cover over him, lying with his feet to the fire. He neither wraps the blanket about him nor lies upon it relying on the warmed earth for warmth below.

On chilly nights in addition to the heated ground beneath the bed you can build a big camp fire six feet or so in front of your leanto shelter and the heat will be reflected down upon the sleeper. You must have a windbreak of cloth leanto, boughs, or rocks. The fire should be kept going all night and for this one needs a lot of wood, so carry a larger chopping axe if you are to encounter very low temperatures. Even with this fire it is hard for one man to keep warm and get a good night's sleep. Two men, however, can change off, watching the fire and sleeping.

The warmest and most portable bed then is in reality patterned after the one of civilization.

Essentially it will keep the sleeper high and dry by means of the waterproofed cloth over browse or the filled browse bag and it will keep the body warm by the woolen blanket rolled snugly about you.

CHAPTER X

CHOOSING THE LIGHT WEIGHT MESS KIT

THE light weight mess kit combines the fewest utensils with which a person can prepare his own meals from the raw materials. It must nest compactly, have as few component parts as possible, be comfortably carried on the person while en route, contain space for a lunch or emergency ration and possibly have provision for carrying water. To meet these demands one may well include the following articles: — a fry pan (possibly rigged up as a baker also), a stew kettle, a cup, a light fork, spoon and knife and a canteen. Most of the so-called light weight individual outfits center around the above as the essentials with variations in shape to best suit the particular outfit for easy nesting.

The preparation of food by frying is not the best thing for the stomach, for the average bit of fried stuff is enveloped in tough greasy coating. However most cooks use this method to some extent, so provision for frying must be

made. The frying pan is preferably made of steel and in use is to be rested on a bed of coals raked to one side of the cooking fire. If one prefers to utilize the big open fire the fry pan handle should have a square socket into which one may fit a stick to extend the handle, the same to be newly fashioned at each camp. For the lightest kits use a small No. o pan with a socket.

The component parts of any outfit will vary according to the condition and temperament of the user and the nature and locality of experience. He has to choose from a multitudinous and confusing array of impedimenta offered by well meaning and alluring advertisements.

The camper who is choosing his light individual mess kit has the privilege of gathering together those utensils selected along lines above suggested and easily procurable at any store or of getting through the regular sporting goods dealers some specially made kit whose greatest recommendation is compactness with lightness and utility. It must have a pot and a fry pan and these with a pocket or hunting knife and a pointed or flat stick answer all purposes. One must compromise between weight and comfort.

Many cook outfits offered by sporting goods houses are too complete for a place in the hik-

er's kit, in fact their very completeness renders them impractical because of weight, bulk and the number of utensils to be kept track of. They are made more in answer to the call of city sportsmen with fastidious trend of mind who as a rule favor more elaborate equipage throughout.

In choosing a cooking outfit weight is the first consideration. One does not wish to carry heavy stove utensils nor are such needed. They must be strong enough, however, for hard service. In the second place compactness is a desideratum, for here we must reduce bulk. The common utensils of the shop will not nest well for they are all spouts, bail ears, handles and cover knobs. One can reduce the bulk by getting such articles as nest into one another. In making up the light weight mess kit the nesting idea should certainly be carried out but never at the cost of utility.

Of materials tin and iron are the cheapest and they may be light enough. Here their merits end. Iron will rust and neither iron nor tin will stand rough handling. Utensils of such material are hard to clean when greasy and if the joints be soldered one is kept in mortal fear of their early destruction. The so-called armorsteel which is strong stamped steel with

heavy tinning is quite good if one can get nothing better.

Enamel ware is the easiest to keep clean and its poor heat conducting properties makes it for some things preferable. It has a tendency to chip and flake under rough handling or in cold weather. This latter fault can be remedied to some extent by gradual warming of the article before exposing to fierce heat. Enamel ware is not much heavier than other ware that is sufficiently strong for outdoor service.

Aluminum alloy is a boon to the camper, it being the ideal material for certain outdoor utensils. It stands up in all climates — tropical, frigid north, in use on horseback trips, in canoe work, sledging or on the hike. It is much the lightest material we have. Any sporting goods dealer can supply you. The unalloyed aluminum is too soft and easily bends out of shape with hard usage and dry heat, hence a stiffener is added yet without appreciable change of weight. Aluminum alloy has few merits beyond lightness: it is a quick heat conductor, hence the cup had better be of some other material such as enamel ware so as to save the lips from blistering. Also under the application of dry heat to an aluminum fry pan the food sticks and burns so the fry pan is prefer-

ably of light stamped steel. However, where lightness is the great desideratum all parts of the cooking kit should be made of aluminum alloy.

The most commonly used outfit is the one mentioned, consisting of fry pan, kettle, cup, knife, fork and spoon with perhaps a canteen. The first three articles represent the essential components of an ideal individual mess kit and provision for these in some shape or form is made in most every mess kit combination you will come across. The above outfit I have used for years, gotten together in the first place because the parts were easy to get hold of and then they were retained because they did the work expected of them — they withstood the "acid test." The large tin cup, Army pattern, I carried at my belt where it is easy to reach and thus escaped the trouble to nest. In it I steeped tea thus doing away with a special teapot. The kettle of tin was used for boiling water, making stews, etc. Its wire bail I luckily lost and therewith attached a chain bail which stays put when suspending the pot over the fire and it is not cumbersome when packing away. The fry pan is a small Number 0 size with socket for extension handle. It is covered with a tight fitting lid and thus does duty as a

baker. By heaping coals upon it one gets the envelope of hot air.

The United States Army Meat Can combines a frying pan and baker: the deep bottom also serves as a soup plate and the lid as a serving plate. When the lid locks in place over the pan by the hinged handle it becomes a roomy receptacle for lunch carrying on the march, the metal ring on one end allows of its attachment to the soldier's belt or the whole thing can be stored in the pack sack. It is an ingenious contrivance and ideal for the tramper's use.

A large aluminum alloy tablespoon, a small steel fork and the sheath or pocket knife or flat stick which displaces the table knife completes the kit. On certain trips where water is scarce I add a second hand, felt covered Army canteen.

Regarding inspirators, broilers, fire irons and other clap-traps, let it be known that though seemingly insignificant they furnish more details to look after, but as a rule they do not possess sufficient advantage to pay for the care and labor of transporting on a light trip.

On a hiking trip the combined fry pan and baker will be used. With this very acceptable breadstuffs can be coaxed out of camp fire heat, dough and the frying pan. Indeed in emergency the frying pan itself may be discarded

and in such a contingency one can make very good bread by winding the dough around a cleaned stick and slanting it up by the side of the fire.

Canteens are nearly always a necessity in mountainous regions where your work carries you on the ridges high above the valleys where the streams are. In the desert a special water supply must be planned for. In ordinary hunting or tramping trips the smaller Army canteen supplies the more urgent needs. Where the water supply is contaminated it is necessary to boil and filter the water for drinking. This can be done at mealtimes and then cooled and carried in the canteen for use on the march. The purpose of the felt covering of the canteen is to keep the contents cool by the evaporation from the wetted felt.

As a rule one will, on a light trip, carry no folding grate or fire irons as supports for utensils. Rocks, logs or earthen trenches will take their places and one does not have to tote them around.

In choosing the hiker's light weight mess kit take only those component parts that are really needed and have these as strong, light and compact as is possible.

CHAPTER XI

THE RATION LIST

SUPPOSEDLY the greatest privation which will confront the amateur woodsman who breaks away from home ties for a few weeks' jaunt into the wilderness is a gastronomic one. Yet with a properly balanced ration list composed of goods procurable of any grocer with perhaps the addition of some of the newer evaporated foods available on special order or made at home, the hiker may hit the trail confident that he will be well fed.

The hackneyed slogan of outfitting, viz.: — to secure the maximum in efficiency from supplies which represent a minimum in carrying weight and bulk — must be reiterated in choosing the tramper's food supply. For those demanding the extreme in portable equipage the evaporated foods — vegetables (as dried potatoes, Julienne, etc.,) soups (Erbswurst), eggs, milk, etc., are invaluable. In their preparation by dessication the fresh vegetables are deprived

of their water content so that all one needs to do in preparing them for table use is to add water and cook in the usual way. They are thus restored to their former value as palatable foods although of course their form and shape may be altered.

Their chief value for our purpose is that they represent a tremendous reduction (of approximately 15 per cent) in their natural weight and a corresponding lessening of bulk. For example a pound of evaporated potatoes will represent seven pounds of the fresh product. Or again one pound of granulated dried egg represents four dozen of the fresh eggs. Dehydrated goods are equal to fresh goods and are far superior to the canned kind. They are palatable and nutritious as foods, they never spoil and permit a welcome variety in the bill of fare. Concentration of bulk alone is not the criterion in choosing camp foods — digestibility is really paramount. Thus cheese, nuts, beans, rice and the various evaporated foods are highly concentrated but differ greatly in their ease of digestion.

Food for the hiker, as we have said, must with the least weight and bulk furnish appetizing and digestible nourishment to an active man. It should be composed of the proper propor-

tions of fat, protein (which comprises the elements of lean meat) and cereal. It should pack easily under all conditions of heat, moisture and rough handling and must cook simply.

The following items are looked upon as the essentials in diet lists for campers: — flour, bacon, beans, tea, sugar. They represent the three classes of foods necessary to health. For increasing the palatability and variety of the bill of fare other items creep in and they are admissible if they represent in food value and concentration of bulk the same as a given amount of the essential food for which they were substituted.

Bush life develops a great appetite, therefore figure well on the necessary amounts to be packed. Too much means discomfort and fatigue in packing and too little means hunger and perhaps privation. Little dependence should be placed upon securing game or fish en route unless one is certain that he is in a country where such are present in reasonable abundance and that there is nothing to interfere with procuring them.

In general it may be said that for each week about twenty pounds of food stuff are needed per man. The following proportions of the various items will be found about right: —

Food for One Man One Week

Wheat flour	5	pounds
Corn meal	4	pounds
Bacon	5	pounds
Beans	1¾	pounds
Sugar	1¾	pounds
Dried fruit	1	pound
Rice	1	pound
Baking powder	¼	pound
Tea	¼	pound
Salt	¼	pound
Pepper	small	amount.

Dried Egg substituting a portion of the meat ration.
Dried soup and vegetables substituting a portion of the bean or flour ration.

On the trail count on cooking but two meals a day, morning and night with a noon-day stop with lunch and hot drink. This allows time for a day's work.

Foods will keep well if care is taken to exclude moisture by packing in provision bags of closely woven muslin, size 6 by 10 inches with tie strings for closing the open end. They are made waterproof by painting with paraffin, which has been liquefied in gasoline. Mark each bag well. They stow away nicely in odd corners of the pack sack.

Bacon is the great standby in the meat line. Only the leanest should be chosen: trim off the rind before starting on the hike and wrap it in a piece of waterproof muslin to protect it from other items of the outfit. Do not seal it too

tight as it will mold. As bacon grease will be used instead of lard the latter can be omitted entirely.

The flour ration should be made up of whole wheat or graham flour and yellow corn meal. For a stimulating beverage coffee is generally preferred in the United States and tea in Canada. The latter is much easier to transport and more sustaining to the body. If properly chosen you can eliminate the tea or coffee pot from the camp outfit. George Washington coffee and Instant Postum are powdered preparations and all that is needed is to put a teaspoonful in a cup of hot water, stir up, sweeten and drink. If you use tea get the tea tabloids which are a great convenience because of their extreme compactness. Sufficient for 100 cups of good tea occupies only about as much space as one or two ounces of loose tea leaves. For use throw one tabloid into a cup of hot water, wait a minute and a satisfying infusion is the result. Tea in general is to be preferred, for an ounce of it will go as far as many ounces of coffee.

Dried fruits such as raisins, figs, etc., should always be included in the ration list. They make fine emergency rations to be carried in the knapsack (with a cake of sweet chocolate

added.) Chocolate beats whisky for putting new energy into a fellow who is all in. When raisins are cooked up alone or with rice one gets an agreeable change in the bill of fare. Rice is one of the most concentrated foods we have, it is easy to pack and cook and has great sustaining powers as an article of diet. It has food elements of such a kind that it can be taken in place of potatoes or bulky breakfast foods. To cook rice, add gradually the washed kernels to furiously boiling salted water and keep this over the fire for 20 minutes. Powdered milk is on the market and is more satisfactorily purchased than made at home. It is the milk of choice when you have to cut down weight as on a hike.

Baking powder should be pure, and it should be kept in air and water tight containers and sunk in the middle of the flour sack. I keep it in an aluminum flask with a cork lined metal screw top. When moisture reaches baking powder a chemical change takes place destroying its leavening powers and it is useless for cooking purposes. Keep this in mind in considering self rising flours which have the baking powder mixed with the flour in proper proportions for use and simply requiring the addition of water before cooking.

One has a remarkable craving for sweets when on the trail which only sugar will satisfy. Sugar is the most concentrated food we have for it supplies so much heat and energy to the body. In cold weather Nature calls for more heat in the body and one's appetite for sweets usually increases in proportion. Much is written in camp outfitting concerning a preparation called saccharine or crystallose which is a chemical of remarkable sweetness — a small portion of it equalling in sweetening power several hundred times its bulk of sugar. Do not depend on it, for its chemical action delays digestion and it does not furnish the food value which sugar does.

Dehydrated Navy Beans

In preparing dried bean meal one uses ordinary navy beans which are cooked in the usual way and then baked in an oven. By spreading this product out in a broad flat bottomed pan and continuing the baking or drying out process in the oven the moisture is all driven out and only a crumbling crust remains. This is pulverized and packed in tight fitting tins or in waterproof sacks. It is used as a soup or gruel. Common baked beans which come in tins from the corner grocer may be put into the broad

bake tins and thoroughly dried and packed away. As beans are hard to boil in high altitudes you can prepare them at home by parboiling without salt in the water, drying well and later using by cooking as usual in salted water.

Jerked Meats

In the palmy days of the "late lamented wild west" the Indian hunters preserved meats by a method called "jerking." The flesh would be cut into strips and laid on light wooden racks in the sun or in the smoke of a camp fire until dry and hard. This would be packed away and used in the winter time much the same as we use the dried beef of the butcher shops of today. You can preserve meats — steaks, game, or fish — this way or after the improved method of Dr. Hornaday of the New York Zoological Garden. He takes meat cut into strips and works well into the flesh a mixture of salt 1 pound, allspice 1⅓ tablespoonsful and black pepper 1½ tablespoonsful. Then he hangs it up by a string in the sun if the air is dry as in the mountains or, if not, in a camp fire smoke protected from the wet. It can be eaten uncooked and tastes fine after a month or so has passed.

Erbswurst

One of the best concentrated foods for campers and one admirably suited for use as an emergency ration is Erbswurst — a meal preparation used by various European armies. As it is hard to get except from grocers of the larger cities or sporting goods dealers one can well make it at home as follows: — Procure common dried peas and navy beans and dessicate them after cooking as suggested above (see paragraph on Dehydrated Navy Beans). Of the pea meal use one pound; of the bean meal 1¼ pounds; bacon chopped fine and dried, and onions pulverized, of each ⅛ pound. Mix all together and run through the grinder again, dry and pack away. It is used to make a thick soup and is very nutritious.

Evaporated Egg Powder

Probably the most remarkable dried food of all is the evaporated egg. Take ½ dozen eggs and beat them up hard with an egg beater. Take two flat bottomed baking pans from the kitchen and spread a very thin layer of egg thereon. Now in drying should you put this in the oven it will cook whereas if simply set in the sun during the day the moisture is evapo-

rated and a crust of the essential elements retaining all the nourishment and flavor of the egg remains. True the product is shapeless as far as the ordinary conception of an egg is concerned but it is very effective for cooking where weight and fragility in packing are concerned. After the eggs have been in the sun all day remove indoors and if dry run through a cleaned coffee mill. This pulverizes the mass. It should next be completely dried out in the sun and packed away in empty molasses tins with pry up lids.

A pound of evaporated egg equals four dozen fresh eggs and one tablespoonful of egg powder with two tablespoonsful of water represents an egg. It is useful in omelets, scrambled or in combination cooking. Besides being a great saving in weight since one does not have to carry around the water, the evaporated preparation enables us to utilize eggs on the hardest kind of a hike where if we were forced to use fresh eggs their place in the knapsack would be positively prohibited because of their fragility.

Pemmican

When much fat is required for the body as in colder regions no food has been found to

surpass Pemmican. Peary says: — "Pemmican is the most concentrated and satisfactory of all meat foods and is absolutely indispensable on long Arctic sledge journeys." For a ten pound lot take of lean meat, 5 pounds; fat (suet) 4 pounds; dried fruit (raisins) ½ pound and of sugar ½ pound. Cut the meat in thin slices, dry several days as directed under "Jerked Meats." Pulverize between two stones or otherwise grind and mix well with the suet, melted, to a paste, add the ground currants or raisins and sugar, allow to cool and pack away. Eat raw, boiled with flour or fry.

Lemonade Powder

This makes an agreeable lunch drink and is really necessary to keep the system in good order. Take the clear juice of three lemons and 15 teaspoonfuls of sugar and put into a broad, flat baking pan. Since so much water is to be evaporated it is best to dry this out in an oven, but prolonged exposure to a hot sun will do the trick. The lemon powder should be perfectly dry and then pulverized and stored in pry up tins. For use put the powder in water to the desired strength. The addition of citric acid crystals in small amounts is a help, but when relied upon alone to make lemonade,

as recommended by some writers, will not make a drink which takes the place of the concentrated lemon except as to taste.

Breads

Bread is the staff of life. Just as good bread can be baked in the woods as in the best hotel of the boulevards. The baking of camp bread can be taken as a criterion of the amateur cook's ability. Have a good baker, a good fire and follow the recipe if you would have success. On back pack trips it is advisable to retain the frying pan as the baker and by using a tin cover you can heap coals upon it and get the envelope of hot air. Lay two green chunks or two square edged stones about 6 to 8 inches apart near the camp fire. Rake a few coals between and place the pan over them. Put the dough in the pan after sprinkling with flour and cover with the tin. Place live coals on this tin — about twice as many as underneath — and watch the baking closely so that it won't burn. You can fry bread on the top of stone: when one side is baked stand the pan on edge by the side of the stone and allow baking to proceed in that way.

Remember that small cakes and biscuits must be baked quickly before a hot fire whereas

large loaves, such as johnny cake, must have a slow even heat so as to get done through. The secret of the camp oven is the envelope of hot air which must not be too hot and must be kept even. Below are given the recipes which are most successfully used with the frying pan baker. Whole wheat flour makes easier than white and has more taste. Use yellow corn meal. In the recipes follow exactly to obtain the best results.

Self-rising Flour

To save packing several ingredients separately it is often recommended to mix the johnny cake and pan cake flour at home and carry it in one sack on the trail. Then merely mixing with water to a given consistency will be sufficient to supply a good dough. If dampness is kept from it while packing it is very good and the following recipe will be found satisfactory: — take of granulated yellow corn meal 1 quart, of white wheat flour 1 pint, sugar ½ cup, salt 1 teaspoonful and baking powder 4 teaspoonsful. For flapjacks in camp take a portion of the above flour mixture and add sufficient water to make a stiff batter and allow it to stand for a few minutes before dropping it in spoonfuls on the hot greased fry pan: when bubbles begin

to show on top turn. To make a johnny cake or corn bread use less water than above so as to make a doughy mass, turn into the fry pan, set up before the fire and leave until the top sets, then turn over.

A method for corn pone in which the ingredients are mixed at each baking: — 1 pint of water in a pail is brought to a boil, add a teaspoonful of salt, corn meal is slowly added and stirred to a mush, cooking it for a few minutes. Grease the fry pan, put in the mush, cover with tin, bury in the ashes and coals, and bake 30 to 40 minutes. This makes the finest kind of breadstuff.

Army Bread

This is easy to mix, is made without grease, keeps fresh for a long period and will not dry up or mold. It is good to eat when cold and is just the thing when laying in a supply. For routine diet it is much better than biscuit. Take of flour 1 quart, salt 1 teaspoonful, sugar 1 tablespoonful, and baking powder 2 heaping teaspoonfuls. Mix in 1½ pints of cold water to make a thick batter and pour out level into a pan. Bake 45 minutes or until a sliver will not stick into the dough.

Fish

One of the delights of camp life is in estranging one's self from the fastidious customs of civilization and living off the country where you camp. A fine pastime and diet change is the catching and eating of fish. The lakes and streams of the outdoors abound with fish which when caught in the icy water and cooked over a camp fire in the open makes a welcome addition to the hiker's bill of fare. Trout are easily cooked. Black bass are good if the water where you catch them is cold. Pike is the best American food fish. They should be left uncleaned never longer than one-half day after catching, never leave in water and don't wash until just before cooking. Roll in cornmeal, have plenty of bacon fat in the fry pan and cook slowly. Try with the tine of fork to see if done.

For digestible frying use a shallow pan and little grease, heat the pan and grease just enough to keep the meat from sticking. The meat must be dry or it will absorb the grease. Cook quick at first to seal in the juices and turn frequently; do not jab too much with fork for that would let the juice escape.

The seasoned hiker is little apt to be separated from his outfit, but it can and sometimes is done and then one must be able to cope with a real emergency. Every individual outfit should contain emergency food. It is a safe plan never to become separated from your party without an emergency ration with you and materials for securing game and fish if such abound in the region.

CHAPTER XII

HEALTH HINTS FOR HIKERS

Care of the Feet

THE conditioning of the feet will be done while as a pedestrian you are preparing for some long hike. Curative measures for foot maladies then are to be undertaken at home. In caring for the feet a definite toilet routine should be established and adhered to in order to keep these worthy members in a shape fit to do the work expected of them.

In the morning before starting dust talcum, equal parts of talcum and zinc stearate, or the United States Army foot powder inside the stocking or smear over the foot a medicated ointment, oil or vaseline.

On a long tramp should the feet become tender one may well at the noon rest change socks and substitute dry ones or at least beat the worn socks with a stick to straighten out any wrinkles that may have formed, then dry them as well as you can.

In the evening attend to washing the feet and legs as soon as possible after the march. Cool water seems best to allay the sensation of heat and irritability resulting from their forcible impact on the road. Use very little soap if any and dry the feet well with a soft towel and apply friction gently until the skin is red.

If there is any tendency toward rawness of the skin add common salt to the bathing water. Weston, the famous pedestrian, when asked what special preparation of the feet he made before his long record-breaking walks said that he " pickled his feet in a strong solution of common rock salt — the kind used for ice cream making — at the temperature of the body. Souse and soak the feet at bedtime. Then dry and if available souse them with extract of witch hazel which is allowed to dry on."

A tendency toward sweaty feet is natural with certain individuals. The sweat glands are simply over-active and the secretion easily decomposes and is highly offensive. The resulting softening of the skin permits of its rubbing off easily, and abrasions and blisters are apt to form. The treatment should be applied as soon as there is any sign of the trouble and is as follows: Bathe the feet in cool water and carefully dry them. Then paint with commer-

cial formalin 1 part and water 9 parts and if this causes a burning of any portion of the raw skin wash it off with water. If formalin is not at hand a strong tea infusion or tannic acid solution will work as well. The object is to harden and practically tan the superficial layers of the skin and alter the secretions of the sweat glands. Repeat the above every other day for six days. Then dust with the Army Foot Powder.

U. S. Army Foot Powder

Salicylic acid	3 parts
Powdered starch	10 parts
Talcum powder	87 parts

This is antiseptic, astringent and soothing.

Under a combination of dampness and heat the skin becomes soft and tender and is apt to become blistered and abraded. Unaccustomed exercise and ill fitting shoes are responsible for most of the blisters which develop on the foot, usually on the heels and toes. They constitute the most serious troubles with which the amateur pedestrian will have to contend, especially those with a soft skin and sweaty feet. On a long hike the condition should have been averted by the toughening treatment at home as outlined above. In blistering the skin is raised and filled with a collection of watery serum. The

fluid must be evacuated and the skin left intact as a protective cover during the healing process. Remove the fluid by passing a needle, which has been heated until red, obliquely through the sound skin at the edge of the blister, withdraw and allow the fluid to escape. In the case of very large blisters use a needle and thread and sterilize by boiling. Pass through the blister and snip off the ends of the thread to within ¼ inch of the blister and leave it to act as a drain. Cover all with a soft clean cloth until the serum is all out then cover with adhesive plaster. One can thus continue walking without pain and rely upon complete recovery in a couple of days.

Abrasions are blisters with skin removed, due to rubbing of the shoes in walking and they are very painful because of the access of air upon the exposed nerves of the true skin. Small abrasions may be washed clean and dried, covered with an adhesive strip, and dismissed. Larger ones may need to be cleaned and treated with some antiseptic ointment and covered with absorbent cotton and adhesive. The secret is to prevent them in the first place by proper foot care, and if started to examine and treat them from time to time to prevent their enlargement.

A corn is a circumscribed thickness of skin at a point, usually on a toe, where there is pres-

sure and friction between a bony prominence and the shoe. It is similar to a callus but differs from the latter in having a central peg or core projection inward toward the bone and by pressing on fine nerves producing pain. The pain stops when the outside pressure is removed. If the corn is between two toes where it becomes macerated by heat and moisture it is called a "soft corn."

In treating a corn the cause must be remedied and this usually consists in getting footwear with plenty of "toe room," thus relieving the pressure. For cure the callosity must be softened and removed. If the corn is not severe simply softening by soaking in hot soapy water and paring with a razor-sharp knife blade will often suffice. To remove corns: (1) Wash the foot well at bedtime. Soak for ten minutes in hot soapy water which will soften a corn so it will appear white. (2) Wipe dry. (3) Apply corn medicine. The chief ingredient of most of the advertised corn cures is salicylic acid and a convenient preparation is made by your druggist as follows:

CORN COLLODION

Salicylic acid	11 parts
Extract Cannibis Indica	2 parts
Alcohol	10 parts
Flexible collodion	77 parts

Apply with a wisp of cotton twisted on a match or toothpick, dip in solution and paint on the corn and allow to dry. Repeat the above nightly for four times. (4) On the fourth night the corn should be dead and whitish in color. After washing pare around the edge of the corn with a knife blade and lift the core out in one piece, including all of the thickened tissue down to the quick. The result is a complete cure if the attachments of the corn are taken out all at once.

Soft corns must be treated the same as hard ones: soften the corn tissue so it will come away without pain. Preferably here one should use an ointment instead of collodion; salicylic acid 40 parts, vaseline 30 parts and lanolin 30 parts. Smear this over the corns and keep the toes apart with absorbent cotton. Remove the cause.

Because they are so common foot injuries must not be resigned to as inevitable. Prevention is simple and the rewards to the tramper adequate.

Hygiene of Camp Life

As pertains to normal life anywhere the hiker must observe the accepted precepts of hygiene in order to derive the greatest benefit from his

health giving pastime. The feet must be kept sound as emphasized in the foregoing, the stomach and bowels normal and temperance in all things strictly observed. Our aim is not to train and diet for record breaking feats, but to develop a reasonable endurance and become healthy.

As soon as is possible after a walk rub down with a wet towel and friction to a glow with a dry towel: this is very refreshing and quickly dispels stiffness. While walking produces a good appetite, eating and drinking must be moderately indulged in after a long walk, just satisfying the pangs of hunger else you will lack energy instead of gaining it. Be careful not to become overheated: in cold weather ease up near the end of the journey to cool off gradually and thus prevent chill.

Medical and Surgical Kit

No wilderness adventurer should hit the trail without a knowledge of a few principles in the treatment of medical and surgical ills and he should always be equipped with a simple compact first aid kit. This should contain an emergency wound packet such as is issued our Army and consisting of the following — a pad of sterile gauze and a triangular bandage so

arranged as to be suitable for use as a wound dressing on any part of the body: an ounce of absorbent cotton is useful (a) to filter bad water — boil the latter and pour through cotton held in the cleansed hands; (b) as a dressing for wounds; (c) a small tuft may be wrapped about a toothpick and used to swab foreign particles from the eye. Z O Adhesive Plaster (one inch by five yards) is used on the feet to prevent and treat abrasions and blisters, over finger cuts, to mend fish rods, etc. Take a collapsible tube of vaseline or boric acid ointment for chapped lips; compound cathartic pills for bowel regulation; aspirin tablets, 5 grains each to be used one every four hours for grippe, colds and rheumatism; sun cholera tablets for pain and cramps in the stomach and bowels — one every hour for four doses and in diarrhœa one after each bowel movement; and mosquito dope.

Insect Pests

Throughout the early season until near August first mosquitoes, gnats, deer and black flies are to be reckoned with. The vicious black fly keeps one awake until late in the afternoon, the midges appear about sunset, the deer fly most all the time, and the mosquito mainly

at bedtime. Mosquitoes are worse the further South (in the tropics insects form the worst impediment to travel) or North (even to the bleak mountain tops above timber line) you go. The querulous sing song, poisoned sting and thirst for blood makes of them a real obstacle to the successful enjoyment of a trip. Even one can keep you awake for hours. The amount of annoyance depends somewhat on the person's makeup, some being very susceptible while others are not. You can miss the pest by the choice of a good season. August finds them greatly lessened in numbers hence this is the best month in which to go camping.

For preventing their vicious assaults a head-net fitting down over the shoulders with strings under the arms is often useful when you are about camp but as you look through the cloth when walking in the woods the landscape assumes prismatic aspects. Mosquito bar is too fragile and bobbinet too expensive while cheese-cloth net with a mica or celluloid window is quite satisfactory. Wear gauntlet gloves for hands.

Nine out of ten persons sleep in open camps and as the average tent is not insect proof we must employ certain measures to protect us. To drive the pests away a smudge of green

grass and twigs on a well started fire is a specific but requires attention to keep it up.

A tent may be made fly proof by having a cheesecloth interior which is an exact replica in shape of the tent, the body very loose and voluminous and no openings except when the sides are raised. It is suspended by cords and tapes and is absolutely protective.

The insect repellents used as body applications consist usually of some essential oil incorporated in a lasting base of thick oil or salve which establishes a durable glaze over the skin, preventing too rapid evaporation of the oil by the body heat. These "dopes" do not injure the skin a bit and the slight discomfort they may cause is compensated for by the immunity established. In mildly infested districts oil of citronella applied to the skin will suffice, but where they come at you in swarms a glaze on the skin is needed to hold the essential oil for more continued use. The following formulæ are successful:

Nessmuks Dope

No. 1.		No. 2.	
Pine Tar	3 oz.	Pine Tar	1 oz.
Castor Oil	2 oz.	Oil Pennyroyal	1 oz.
Oil Pennyroyal	1 oz.	Vaseline	3 oz.
		Phenol	3 oz.

No. 3.

Oil Citronella ..... 1 oz.
Spirits camphor ..... 1 oz.
Oil Cedar ..... ½ oz.

Wound Treatment

The first thing is to stop the bleeding by simple pressure with the cleaned finger over the bleeding part or applications of hot water cloths. Once a clean clot is formed don't destroy it. Never use the homely cobwebs to stop bleeding as they reek with germs of blood poison. The second important step is to exclude pus germs. They are fewer in the woods than in the city, but we must be exceedingly careful. Wash the injured part well in hot, soapy water then rinse with water that has been boiled and cooled. Apply the First Aid wound dressing. If the wound is inflamed and discharging pus clean as well as possible and keep the dressing wet with cooled boiled water, reapplying every three hours or sufficiently to keep the dressings wet. On a non-inflamed wound simply apply the First Aid dressing which is sterile and devoid of germs.

In a sprain the ligaments become bruised or torn, there is loss of function and pain with inflammation. Pour hot water on the injured joint for an hour at a time, repeating every two

or three hours for a day. (If no receptacle is at hand to heat water in fill a hollow rock, log, or waterproof cloth pocket with water, heat a stone in camp fire and put in water for heating.) Bandage the joint and keep applying hot water. Keep the limb elevated. When the swelling goes down rub the skin with oil or grease, gently massaging the injured parts. Don't over exercise so as to reinjure the torn ligaments. Walking off a sprain won't cure it, in fact only prolongs recovery.

In a dislocation besides the ligaments being torn the bone is out of place at a joint causing the affected limb to be shorter or longer than its mate. Study how the bone slipped from its socket, for you must reverse the movements occurring at the time of accident in order to reduce the dislocation.

A fracture is a severe malady because a condition of shock is usually present. The affected part is painful, the contour of limb is changed, a grating (crepitation) is felt and heard when the broken ends are rubbed together. The ends are often, by muscular action, drawn out of position so that they overlap. Overcome this muscle tension by steady pulling of the two broken parts in opposite directions until the ends meet in proper relation to one another

(this is imperative). Hold them in place by laying splints of bark or sticks entirely around the break (interposing padding of soft material next the skin) and bandage all in place. If the parts are swelled apply cold water. Healing requires weeks for a good result.

A rather heroic measure was resorted to by Chas. F. Loomis on his long hike from Ohio to California. Having fractured his right arm so badly that the bone protruded (a "compound" fracture) and being alone in a desert he gave his canteen strap two flat turns about the wrist, buckled it around a cedar tree, mounted a nearby rock, set his heels on the edge and threw himself backward. He fainted but the bone was set. Then he rigged up splints and walked 52 miles before tasting food, then finished the 700 mile tramp to Los Angeles with his broken arm in a bandanna.

Those few hardy pedestrians who may venture to indulge in winter walks are subject to having the extremities freeze although if they understand the essentials of keeping warm in winter they may avert such troubles. The effects of heat and cold are about the same; they both cause a loss of blood to the tissues which when thus deprived of heat and nourishment are on the way to mortification. The object of

treatment is to restore circulation, gradually. Use cold baths in a cold room then gradually warming same up to the temperature of the body. Wrap the frozen limb up well with wet cloths for the first few days.

Drowning. A strenuous effort should be made to restore breathing in the apparently drowned and so do not consider your attempt as futile until you have thoroughly employed the method suggested below for two hours. You first

(a) Get the water out of the patient's lungs by loosening all his clothes, laying him on his stomach and turn his face to one side. Now standing astride of his hips grasp him about the waist and raise the hips so that the head and feet touch the ground in order that the water may gravitate out of the lungs.

(b) Again laying the patient on his stomach, head turned aside and with his arms extended above his head he is given artificial respiration after the so-called Schaefer or prone method as follows:

(c) Lung Compression. You kneel on the ground straddling the patient's hips and facing his head. Place your hands so that the little finger closes over the end of the lowest rib and the heel of your hands so placed on the sides as

to allow you to exert all your strength downward from your shoulders until the patient's lower chest region is compressed. You hold this compression for three seconds and then remove the hands and allow the patient's chest to refill. Repeat the compression and lung refilling fifteen times a minute for two hours if necessary.

(d) After breathing is established keep the patient in a recumbent position until breathing is regular and put him in a warm place and surround his body with heat in some form such as heated stones wrapped in cloths, hot blankets, etc. If available for use aromatic spirits of ammonia on a handkerchief held to the nose is stimulating.

Colds. Take a hot bath and a heroic dose of physic. For the aches and pains take aspirin tablets (grains 5 each) one every hour for 4 doses then one every 4 hours. If the throat is sore gargle with salt water.

Diarrhœa and stomach cramps may be due to bad water or improper food. The results are bowel pain and too frequent movements and general weakness. Stop all food and rest the patient in bed entirely. Take a purge and after three good movements take a Sun Cholera tablet each hour until three are taken then one

every three hours. If without medicine use flour mixed with water.

In Sunstroke the skin stops perspiring, the skin over the ribs is hot and dry, the face red and the head feels great pressure of too much blood. Get to a cool place, lie down, loosen the clothing and bathe the face, chest and wrists in cold water and drink as much water as wanted. In Heat Exhaustion the conditions are opposite — the face is pale and the skin sweaty. You need stimulants such as tea or coffee and are not to bathe the skin.

CHAPTER XIII

WINTER TRAVEL AFOOT

FROM the standpoint of pure pedestrianism winter travel usually has but little appeal yet it represents to the uninitiated marvelous revelations in scenic display, for the sedentarian, who is housed in the vitiated air of stuffy steam heated offices, a stimulation to the highest degree of physical well being, and, being feasible, projects one's vacation opportunities to include the year around.

Once experienced the exhilaration of winter travel will enslave you whether your indulgence is for the annual hunt in which you are responding to the issue of the Red Gods calling for snowshoe or ski trips across the waste places, or, again you may follow the trail of the Far North trapper in which case your frequently moved camps necessitate mushing behind a trail sled drawn by huskies or breaking a trail ahead of a bush toboggan propelled by your own power. Again perchance some get rich quick frenzy pushes you into the frozen regions in exploratory reconnaissance for precious metals.

Just what causes most people to refrain from outdoor life in winter is the fear of cold. Yet properly regarded the winter is the healthiest time of the year. Physically greater exertion is necessary in winter to enable the body to generate heat sufficient for protection against cold and this is compensated for in the usually increased difficulties in travel over road or forest snows. Pure tramping methods and kits for summer must be modified to suit new conditions for doubtless you will not have ground to walk upon hence you must take to snowshoes or to ski for the snow work, the body covering must be adequate for additional protection against the elements, and the shelter and bed must be especially adapted to your needs.

Snow-shoeing is becoming more and more popular among lovers of outdoor life. Without them northern bush travel in winter would be impossible because in dense forested areas the brush grows close and the ground is filled with fallen trees and rocks and the snow lies loose and powdery. Snow-shoeing is really at its best after the middle of January when the early snows have packed down and the weather is pretty constantly freezing.

So much has been written of the great tournaments of ski jumping by the Scandinavian ex-

perts that one may lose sight of the fact that ski running for the amateur is an unparalleled winter sport in any snow covered section and is a necessary part of the equipment of mountaineers whose journeyings take them far into the wilderness probably with a pack outfit on their backs.

In this country the winters are as a rule mild and pleasant yet the average American does not appreciate the benefits to be acquired from the use of the ski or the exhilarating and exciting sport to be had with them. The ski (pronounced "skee") is used for walking (really tobogganning or skating) over the deep snow, protecting the walker from breaking through and becoming immersed in a fleecy bath. In regions where the snow gets to the depth of 5 to 7 feet the ski is intensely utilitarian, being a real necessity for travel as otherwise travelers would become hopelessly buried in the drifts and perhaps perish. In this country it is becoming more popular each year and in many sections it is replacing the snowshoe for winter travel.

With ski one may slide down hills of snow or ice, he can walk over drifts without fathoming their depths and if sportively inclined and trained he can speed downhill so fast that the

sense of motion is lost and the scenery is verily "snatched!" past in rapid panorama. Where the country is reasonably open and not too rough the snow becomes fairly solid. Ski are superior to snowshoes and travel is far faster than with the web shoe.

In our mountainous regions there is good snow-shoeing and skiing at elevations of from 200 to 3000 feet from December to April. The climate here is commonly mild with days of continual melting — a temperature of 20 degrees or below being a rarity. The mountain snows are deep, forcing our summer cruising methods to a matter of reminiscence, and this depth increases very quickly as altitude is gained. At 5000 feet elevation the Frost King's mantle may be found to be 20 or 30 feet deep but at this altitude few cabins for camp use can be depended upon.

Special cold weather clothing requirements are imperative for keeping warm in camp and on the trail. Body warmth depends on several things. First, the body's ability to make heat, hence our attention to heat forming foods. That this heat may reach all parts of the body and especially the extremities which are so susceptible to cold, the circulation of blood must

be absolutely unimpeded by such things as tight shoes, constricting waist bands or tight clothing anywhere. Secondly, the surface of the skin must be insulated by a loosely woven fabric covering (best of animal origin) which retains the heat in its meshes yet allows an egress of moisture which is constantly imperceptibly emanated by the pores of the skin and to a superlative degree during exercise. Successive thin layers are found to be more efficacious than one thick layer owing to the dead air interspaces.

The skin and its covering must be kept dry else freezing will ensue. Aside from what moisture may come from the body, wet may come from accidental immersion in streams or the air itself may be very humid — the reason for our greater sensitiveness to wet cold than to dry cold.

A large factor of success in Arctic exploration has been the choice of proper clothing. These explorers have followed down to the last detail the natural clothing of the Eskimo modeled after the protective covering of Arctic animals consisting of the impervious integument itself next the body or with silk intervening. This fits loosely at the knee, waist, and wrist, enabling the evaporation of constant perspira-

tion to the open air, especially during exercise of any kind. The body is thus kept dry and no energy is lost in heat making.

The usual idea of the amount of clothing necessary to keep the body warm and to prevent freezing in extreme cold is erroneous. It is not so much a question of cold as the degree of dampness on the body surface which is affected *by* the cold. Nearly every death from freezing is caused by either getting too warm and then wet through perspiration or accidental immersion in water. The former can be avoided by having the clothing sufficiently loose to allow good circulation of air and by thus *keeping uncomfortably cool* the tendency toward perspiration is overcome. While quiet or physically inactive one may wear much clothing as there is little danger of freezing, there being no dampness present, but if one is active and perspiring and is then quiet there is great danger.

When any kind of moisture gets on the body there is only one way to get rid of it — by the body heat. Clothing does not warm one, it only *retains* heat made by the body. The drawing away of heat reduces one's vitality as well as affecting the temperature of the body. Where one is physically active it is advisable to wear ordinary weight warm winter clothing of

the temperate zone. Of materials wool is best next the body, except in Arctic work where a suit of silk is worn under the fur garments to prevent chafing. Two wool union suits, loosely fitting, will be found enough. The pants should be of Mackinaw which is warm, wearable, and to a certain extent water repellent. A flannel shirt or Pontiac shirt comes next and for use when one is inactive and apt to become chilled a heavy sweater coat with convertible collar is indispensable. To break the wind a parka can be pulled over head and trunk.

The parka is a garment made like a large hooded shirt coming to the knee. The edge of the face opening in the hood has a ruff of wolverine, wolf, or bear to protect the face. Wolverine is by all odds best as it is the only fur upon which the breath will not congeal. The garment is the most practical yet devised for very cold work. For use in the Arctics it is made of squirrel or deer skin worn with the fur outside and it is lined with the fur of some animal which will allow it to slip on and off easily. The drill parka which is used to break the wind and which is of particular interest to us is made on the same model only larger as it is at times worn as the outermost garment of all. The

fur garments are seldom used by those who are experienced when working on the trail, they are held in reserve until camp is reached. If in actual exercise the parka would be too hot and would cause perspiration to start.

Particular attention should be paid to the protection of the hands, ears, face, and feet — the body will take care of itself. For the hands Scotch wool mitts will be ample — mitts rather than gloves for the reason that there is but one space in each to be kept warm whereas in gloves there is a separate place in each finger where heat must be maintained. A larger pair of leather mitts worn over all will be found to retain heat besides resisting wear much better than wool. The ears and face are protected by a wool cap or llama combination cap and sleeping hood. The hood of the parka with its fur edged face opening cannot be excelled for head and neck protection. The face is to some extent exposed necessarily for breathing and the nose may be expected to suffer some. The intense light reflected from the snow will necessitate the use of smoked goggles, those with rubber frames being best as no metal will then touch the sensitive flesh.

Since much of your comfort in outdoor winter work or pastime depends upon the feet a few

words concerning their proper care is not amiss here. Above all the feet must be kept dry. They are pretty apt to perspire and this moisture can be absorbed by filling the bottom of the shoe packs with straw which acts also as a cushion. At the day's end you will find the socks dry and the straw wet — the desirable condition as wet socks will freeze and the feet become chilled. The best foot covering in dry snow is the oiled moccasin or shoe pac. No tight shoes are permissible in snow work at all for they will restrict the circulation by which the warmth of the body is carried to the extremities. For wet snow the outer foot covering should be of rubber, since leather when wet freezes and becomes stiff and for this the lumberman's rubber *over* which has a laced leather top with rubber foot cover is unexcelled. Next the foot wear two pairs of heavy wool lumberman's socks reaching nearly to the knee.

If one is lost in the winter woods a bivouac constructed somewhat along the following lines will be found adequate for the needs of comfort and health. For cold weather shelter select for the site a hollow deep in the woods well surrounded by trees where all will be sheltered from the biting winds. Such a place for the summer camp would not be best because a

night's rain might flood the hollow. First find a wind break of cliff, rocks or fallen tree or build one of rocks or down timber. If it is rainy make a slant roof of poles and shingle with browse or bark and with a top cover of more poles to hold all in place. On the prairie where a windbreak is impossible build two fires at right angles to the wind and get between them. The smoke will blow away in columns parallel with your body.

If the snow is deep shovel to the ground, using the toe of the snow shoe or a flattened stick, clear a triangular space about 7 by 8 feet at whose small end, placed downhill, is put the fire, and at whose small side lays the bed. Walls of snow all around make an excellent wind break. On deep snow the fire may rest on a platform of green sappy logs such as balsam. Where the shelter is pitched the snow is tramped solid. In such a camp with a rabbit skin blanket and an all night fire one may sleep comfortably on the coldest of nights.

In sleeping out even if the days are mild the nights are pretty sure to be cold. A goodly supply of birch bark kindling and a surplus of dry wood should be laid up. It is no fun to awake chilled to the bone from the icy air and have to fumble about with wet half burnt

fagots. Build the fire to leeward and within four feet of the bed. If it is very cold build it above the level of your sleeping place for you thus get more heat and less smoke. Stake two back logs behind the fire. In very cold weather build the fire against the windbreak and when it is burned down rake the embers forward, rebuild the fire in front, spread boughs where the fire was and lie there on the warm ground. This can be repeated several times during the night. If done thus there need be no danger of freezing.

In cold weather in the North, with probably the means of transportation reduced to a dog team or a back pack, the ration list must be cut down to absolute necessities. To facilitate expediency in the handling of the outfit in the cold the range of variety had best be limited. The ideal cold weather ration meeting this requirement is pemmican. At this time of the year the fats should predominate as it does in pemmican. This food keeps well, is very compact and can be mixed in a variety of ways palatable to a hungry man on the trail. Pemmican may be made at home by the method suggested in chapter on "Ration Lists." On such trips do not rely on baking bread en route because of lack of cooking conveniences and time. Also

the moisture in common bread will freeze so use unleavened bread or that ready made hardtack or ship's biscuit as the staple. One pound of pemmican and pilot bread per day will sustain a man at hard work.

Vary the bread ration with dessicated vegetables. Now if you will add to the Arctic ration the above mentioned pemmican varied with jerked meat and the hardtack varied with dessicated vegetables, tea, and dried milk you will have a well balanced, dry, compact, palatable, and energy yielding diet.

APPENDIX

Tramping Kit Check List

Wear.
- Flannel shirt.
- Whipcord pants.
- Belt.
- Wool unionsuit.
- Wool socks.
- Felt hat.
- Shoes or moccasins.

Pockets.
- Map.
- Jack knife.
- Kerchief.
- Waterproof match box.
- Compass.

Pack.
- Pack sack.
- Wool sweater.
- Extra socks.
- Axe.
- Small whetstone.
- Goggles.

Shelter.
- Leanto tent.
- Blanket.
- Browse bag.

Fishing outfit.

Camera and Film.

Medical supplies.
- Emergency wound dressing.
- Z O Adhesive plaster.
- Tube vaseline.
- Cathartic pills.
- Aspirin tablets, 5 grains.
- Sun Cholera Tablets.
- Mosquito dope.

Toilet.
- Tooth brush and soap.
- Two crash towels.

Repair kit.
- Thread and needles.
- Safety pins.
- Waxed linen thread and awl.

Mess kit.
- Fry pan and cover.
- Aluminum quart pot.
- Aluminum quart cup.
- Aluminum spoon.
- Fork.
- Small butcher knife in sheath.

Ration List. For one man one week.

Wheat flour	5 Lbs.
Corn meal	4 Lbs.
Bacon	5 Lbs.
Beans	1¾ Lbs.
Sugar	1¾ Lbs.
Dried fruit	1 Lb.
Rice	1 Lb.
Baking powder	¼ Lb.
Tea	¼ Lb.
Salt	¼ Lb.
Pepper	Small amount.

- Dried Egg substituting a portion of meat ration.
- Dried soup and vegetables for a portion of bean and flour ration.
- Wool soap, 1 bar.
- Matches, can of 500.

OUTING HANDBOOKS

The textbooks for out-door work and play

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Two hundred titles are projected. The series covers all phases of outdoor life, from bee-keeping to big-game shooting. Among the books now ready or in preparation are those described on the following pages.

If you wish for any information on any outdoor subject not treated in one of the following books write Outing Publishing Co., 141-145 West 36th St., New York.

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1. EXERCISE AND HEALTH, by Dr. Woods Hutchinson. Dr. Hutchinson takes the common-sense view that the greatest problem in exercise for most of us is to get enough of the right kind. The greatest error in exercise is not to take enough, and the greatest danger in athletics is in giving them up. He writes in a direct matter-of-fact manner with an avoidance of medical terms, and a strong emphasis on the rational, all-around manner of living that is best calculated to bring a man to a ripe old age with little illness or consciousness of bodily weakness.

2. CAMP COOKERY, by Horace Kephart. "The less a man carries in his pack the more he must carry in his head," says Mr. Kephart. This book tells what a man should carry in both pack and head. Every step is traced—the selection of provisions and utensils, with the kind and quantity of each, the preparation of game, the building of fires, the cooking of every conceivable kind of food that the camp outfit or woods, fields or streams may provide—even to the making of desserts. Every recipe is the result of hard practice and long experience.

3. BACKWOODS SURGERY AND MEDICINE, by Charles S. Moody, M. D. A handy book for the prudent lover of the woods who doesn't expect to be ill but believes in being on the safe side. Common-sense methods for the treatment of the ordinary wounds and accidents are described—setting a broken limb, reducing a dislocation, caring for burns, cuts, etc. Practical remedies for camp diseases are recommended, as well as the ordinary indications of the most probable ailments. Includes a list of the necessary medical and surgical supplies.

4. APPLE GROWING, by M. C. Burritt. The various problems confronting the apple grower, from the preparation of the soil and the planting of the trees to the marketing of the fruit, are discussed in detail by the author.

5. THE AIREDALE, by Williams Haynes. The book opens with a short chapter on the origin and development of the Airedale, as a distinctive breed. The author then takes up the problems of type as bearing on the selection of the dog, breeding, training and use. The book is designed for the non-professional dog fancier, who wishes common sense advice which does not involve elaborate preparations or expenditure. Chapters are included on the care of the dog in the kennel and simple remedies for ordinary diseases.

6. THE AUTOMOBILE — Its Selection, Care and Use, by Robert Sloss. This is a plain, practical discussion of the things that every man needs to know if he is to buy the right car and get the most out of it. The various details of operation and care are given in simple, intelligent terms. From it the car owner can easily learn the mechanism of his motor and the art of locating motor trouble, as well as how to use his car for the greatest pleasure.

7. FISHING KITS AND EQUIPMENT, by Samuel G. Camp. A complete guide to the angler buying a new outfit. Every detail of the fishing kit of the freshwater angler is described, from rodtip to creel, and clothing. Special emphasis is laid on outfitting for fly fishing, but full instruction is also given to the man who wants to catch pickerel, pike, muskellunge, lake-trout, bass and other freshwater game fishes. The approved method of selecting and testing the various rods, lines, leaders, etc., is described.

8. THE FINE ART OF FISHING, by Samuel G. Camp. Combine the pleasure of catching fish with the gratification of following the sport in the most approved manner. The suggestions offered are helpful to beginner and expert anglers. The range of fish and fishing conditions covered is wide and includes such subjects as "Casting Fine and Far Off," "Strip-Casting for Bass," "Fishing for Mountain Trout" and "Autumn Fishing for Lake Trout." The book is pervaded with a spirit of love for the streamside and the out-doors generally which the genuine angler will appreciate. A companion book to "Fishing Kits and Equipment."

9. THE HORSE—Its Breeding, Care and Use, by David Buffum. Mr. Buffum takes up the common, every-day problems of the ordinary horse-users, such as feeding, shoeing, simple home remedies, breaking and the cure for various equine vices. An important chapter is that tracing the influx of Arabian blood into the English and American horses and its value and limitations. A distinctly sensible book for the sensible man who wishes to know how he can improve his horses and his horsemanship at the same time.

10. THE MOTOR BOAT—Its Selection, Care and Use, by H. W. Slauson. The intending purchaser is advised as to the type of motor boat best suited to his particular needs and how to keep it in running condition after purchased.

11. OUTDOOR SIGNALLING, by Elbert Wells. Mr. Wells has perfected a method of signalling by means of wigwag, light, smoke, or whistle which is as simple as it is effective. The fundamental principle can be learned in ten minutes and its application is far easier than that of any other code now in use.

12. TRACKS AND TRACKING, by Josef Brunner. After twenty years of patient study and practical experience, Mr. Brunner can, from his intimate knowledge, speak with authority on this subject. "Tracks and Tracking" shows how to follow intelligently even the most intricate animal or bird tracks; how to interpret tracks of wild game and decipher the many tell-tale signs of the chase that would otherwise pass unnoticed; to tell from the footprints the name, sex, speed, direction, whether and how wounded, and many other things about wild animals and birds.

13. WING AND TRAP-SHOOTING, by Charles Askins. Contains a full discussion of the various methods, such as snap-shooting, swing and half-swing, discusses the flight of birds with reference to the gunner's problem of lead and range and makes special application of the various points to the different birds commonly shot in this country. A chapter is included on trap shooting and the book closes with a forceful and common-sense presentation of the etiquette of the field.

14. PROFITABLE BREEDS OF POULTRY, by Arthur S. Wheeler. Mr. Wheeler discusses from personal experience the best-known general purpose breeds. Advice is given from the standpoint of the man who desires results in eggs and stock rather than in specimens for exhibition. In addition to a careful analysis of stock—good and bad—and some conclusions regarding housing and management, the author writes in detail regarding Plymouth Rocks, Wyandottes, Orpingtons, Rhode Island Reds, etc.

15. RIFLES AND RIFLE SHOOTING, by Charles Askins. A practical manual describing various makes and mechanisms, in addition to discussing in detail the range and limitations in the use of the rifle. Treats on the every style and make of rifle as well as their use. Every type of rifle is discussed so that the book is complete in every detail.

16. SPORTING FIREARMS, by Horace Kephart. This book is the result of painstaking tests and experiments. Practically nothing is taken for granted. Part I deals with the rifle, and Part II with the shotgun. The man seeking guidance in the selection and use of small firearms, as well as the advanced student of the subject, will receive an unusual amount of assistance from this work.

17. THE YACHTSMAN'S HANDBOOK, by Herbert L. Stone. The author and compiler of this work is the editor of "Yachting." He treats in simple language of the many problems confronting the amateur sailor and motor boatman. Handling ground tackle, handling lines, taking soundings, the use of the lead line, care and use of sails, yachting etiquette, are all given careful attention. Some light is thrown upon the operation of the gasoline motor, and suggestions are made for the avoidance of engine troubles.

18. SCOTTISH AND IRISH TERRIERS, by Williams Haynes. This is a companion book to "The Airedale," and deals with the history and development of both breeds. For the owner of the dog, valuable information is given as to the use of the terriers, their treatment in health, their treatment when sick, the principles of dog breeding, and dog shows and rules.

19. NAVIGATION FOR THE AMATEUR, by Capt. E. T. Morton. A short treatise on the simpler methods of finding position at sea by the observation of the sun's altitude and the use of the sextant and chronometer. It is arranged especially for yachtsmen and amateurs who wish to know the simpler formulæ for the necessary navigation involved in taking a boat anywhere off shore. Illustrated.

20. OUTDOOR PHOTOGRAPHY, by Julian A. Dimock. A solution of all the problems in camera work out-of-doors. The various subjects dealt with are: The Camera—Lens and Plates—Light and Exposure—Development—Prints and Printing, etc.

21. PACKING AND PORTAGING, by Dillon Wallace. Mr. Wallace has brought together in one volume all the valuable information on the different ways of making and carrying the different kinds of packs. The ground covered ranges from man-packing to horse-packing, from the use of the tump line to throwing the diamond hitch.

22. THE BULL TERRIER, by Williams Haynes. This is a companion book to "The Airedale" and "Scottish and Irish Terriers" by the same author. Its greatest usefulness is as a guide to the dog owner who wishes to be his own kennel manager. A full account of the development of the breed is given with a description of best types and standards. Recommendations for the care of the dog in health or sickness are included.

23. THE FOX TERRIER, by Williams Haynes. As in his other books on the terrier, Mr. Haynes takes up the origin and history of the breed, its types and standards, and the more exclusive representatives down to the present time. Training the Fox Terrier—His Care and Kenneling in Sickness and Health—and the Various Uses to Which He Can Be Put—are among the phases handled.

24. SUBURBAN GARDENS, by Grace Tabor. Illustrated with diagrams. The author regards the house and grounds as a complete unit and shows how the best results may be obtained by carrying the reader in detail through the various phases of designing the garden, with the levels and contours necessary, laying out the walks and paths, planning and placing the arbors, summer houses, seats, etc., and selecting and placing trees, shrubs, vines and flowers. Ideal plans for plots of various sizes are appended, as well as suggestions for correcting mistakes that have been made through "starting wrong."

25. FISHING WITH FLOATING FLIES, by Samuel G. Camp. This is an art that is comparatively new in this country although English anglers have used the dry fly for generations. Mr. Camp has given the matter special study and is one of the few American anglers who really understands the matter from the selection of the outfit to the landing of the fish.

26. THE GASOLINE MOTOR, by Harold Whiting Slauson. Deals with the practical problems of motor operation. The standpoint is that of the man who wishes to know how and why gasoline generates power and something about the various types. Describes in detail the different parts of motors and the faults to which they are liable. Also gives full directions as to repair and upkeep.

27. ICE BOATING, by H. L. Stone. Illustrated with diagrams. Here have been brought together all the available information on the organization and history of ice-boating, the building of the various types of ice yachts, from the small 15 footer to the 600-foot racer, together with detailed plans and specifications. Full information is also given to meet the needs of those who wish to be able to build and sail their own boats but are handicapped by the lack of proper knowledge as to just the points described in this volume.

28. MODERN GOLF, by Harold H. Hilton. Mr. Hilton is the only man who has ever held the amateur championship of Great Britain and the United States in the same year. This book gives the reader sound advice, not so much on the mere swinging of the clubs as in the actual playing of the game, with all the factors that enter into it. He discusses the use of wooden clubs, the choice of clubs, the art of approaching, and kindred subjects.

29. INTENSIVE FARMING, by L. C. Corbett. A discussion of the meaning, method and value of intensive methods in agriculture. This book is designed for the convenience of practical farmers who find themselves under the necessity of making a living out of high-priced land.

30. PRACTICAL DOG BREEDING, by Williams Haynes. This is a companion volume to PRACTICAL DOG KEEPING, described below. It goes at length into the fundamental questions of breeding, such as selection of types on both sides, the perpetuation of desirable, and the elimination of undesirable qualities, the value of prepotency in building up a desired breed, etc.

31. PRACTICAL DOG KEEPING, by Williams Haynes. Mr. Haynes is well known to the readers of the OUTING HANDBOOKS as the author of books on the terriers. His new book is somewhat more ambitious in that it carries him into the general field of selection of breeds, the buying and selling of dogs, the care of dogs in kennels, handling in bench shows and field trials, and at considerable length into such subjects as food and feeding, exercise and grooming, disease, etc.

32. THE VEGETABLE GARDEN, by R. L. Watts. This book is designed for the small grower with a limited plot of ground. The reader is told what types of vegetables to select, the manner of planting and cultivation, and the returns that may be expected.

33. AMATEUR RODMAKING, by Perry D. Frazer. Illustrated. A practical manual for all those who want to make their own rod and fittings. It contains a review of fishing rod history, a discussion of materials, a list of the tools needed, description of the method to be followed in making all kinds of rods, including fly-casting, bait-fishing, salmon, etc., with full instructions for winding, varnishing, etc.

34. PISTOL AND REVOLVER SHOOTING, by A. L. A. Himmelwright. A new and revised edition of a work that has already achieved prominence as an accepted authority on the use of the hand gun. Full instructions are given in the use of both revolver and target pistol, including shooting position, grip, position of arm, etc. The book is thoroughly illustrated with diagrams and photographs and includes the rules of the United States Revolver Association and a list of the records made both here and abroad.

35. PIGEON RAISING, by Alice MacLeod. This is a book for both fancier and market breeder. Full descriptions are given of the construction of houses, the care of the birds, preparation for market, and shipment, of the various breeds with their markings and characteristics.

36. FISHING TACKLE, by Perry D. Frazer. Illustrated. It tells all the fisherman needs to know about making and overhauling his tackle during the closed season and gives full instructions for tournament casting and fly-casting.

37. AUTOMOBILE OPERATION, by A. L. Brennan, Jr. Illustrated. Tells the plain truth about the little things that every motorist wants to know about his own car. Do you want to cure ignition troubles? Overhaul and adjust your carbureter? Keep your transmission in order? Get the maximum wear out of your tires? Do any other of the hundred and one things that are necessary for the greatest use and enjoyment of your car? Then you will find this book useful.

38. THE FOX HOUND, by Roger D. Williams. Author of "Horse and Hound." Illustrated. The author is the foremost authority on fox hunting and foxhounds in America. For years he has kept the foxhound studbook, and is the final source of information on all disputed points relating to this breed. His book discusses types, methods of training, kenneling, diseases and all the other practical points relating to the use and care of the hound, etc.

39. SALT WATER GAME FISHING, by Charles F. Holder. Mr. Holder covers the whole field of his subject devoting a chapter each to such fish as the tuna, the tarpon, amberjack, the sail fish, the yellow-tail, the king fish, the barracuda, the sea bass and the small game fishes of Florida, Porto Rico, the Pacific Coast, Hawaii, and the Philippines. The habits and habitats of the fish are described, together with the methods and tackle for taking them. Illustrated.

40. WINTER CAMPING, by Warwick S. Carpenter. A book that meets the increasing interest in outdoor life in the cold weather. Mr. Carpenter discusses such subjects as shelter equipment, clothing, food, snowshoeing, skiing, and winter hunting, wild life in winter woods, care of frost bite, etc. Illustrated.

41. *WOODCRAFT FOR WOMEN, by Mrs. Kathrene Gedney Pinkerton. The author has spent several years in the Canadian woods and is thoroughly familiar with the subject from both the masculine and feminine point of view. She gives sound tips on clothing, camping outfit, food supplies, and methods, by which the woman may adjust herself to the outdoor environment.

42. *SMALL BOAT BUILDING, by H. W. Patterson. Illustrated with diagrams and plans. A working manual for the man who wants to be his own designer and builder. Detail descriptions and drawings are given showing the various stages in the building, and chapters are included on proper materials and details.

43. READING THE WEATHER, by T. Morris Longstreth. The author gives in detail the various recognized signs for different kinds of weather based primarily on the material worked out by the Government Weather Bureau, gives rules by which the character and duration of storms may be estimated, and gives instructions for sensible use of the barometer. He also gives useful information as to various weather averages for different parts of the country, at different times of the year, and furnishes sound advice for the camper, sportsman, and others who wish to know what they may expect in the weather line.

44. BOXING, by D. C. Hutchison. Practical instruction for men who wish to learn the first steps in the manly art. Mr. Hutchison writes from long personal experience as an amateur boxer and as a trainer of other amateurs. His instructions are accompanied with full diagrams showing the approved blows and guards. He also gives full directions for training for condition without danger of going stale from overtraining. It is essentially a book for the amateur.

45. TENNIS TACTICS, by Raymond D. Little. Out of his store of experience as a successful tennis player, Mr. Little has written this practical guide for those who wish to know how real tennis is played. He tells the reader when and how to take the net, discusses the relative merits of the back-court and volleying game and how their proper balance may be achieved; analyzes and appraises the twist service, shows the fundamental necessities of successful doubles play.

46. HOW TO PLAY TENNIS, by James Burns. This book gives simple, direct instruction from the professional standpoint on the fundamentals of the game. It tells the reader how to hold his racket, how to swing it for the various strokes, how to stand and how to cover the court. These points are illustrated with photographs and diagrams. The author also illustrates the course of the ball in the progress of play and points out the positions of greatest safety and greatest danger.

47. TAXIDERMY, by Leon L. Pray. Illustrated with diagrams. Being a practical taxidermist, the author at once goes into the question of selection of tools and materials for the various stages of skinning, stuffing and mounting. The subjects whose handling is described are, for the most part, the every-day ones, such as ordinary birds, small mammals, etc., although adequate instructions are included for mounting big game specimens, as well as the preliminary care of skins in hot climates. Full diagrams accompany the text.

48. THE CANOE—ITS SELECTION, CARE AND USE, by Robert E. Pinkerton. Illustrated with photographs. With proper use the canoe is one of the safest crafts that floats. Mr. Pinkerton tells how that state of safety may be obtained. He gives full instructions for the selection of the right canoe for each particular purpose or set of conditions. Then he tells how it should be used in order to secure the maximum of safety, comfort and usefulness. His own lesson was learned among the Indians of Canada, where paddling is a high art, and the use of the canoe almost as much a matter of course as the wearing of moccasins.

49. HORSE PACKING, by Charles J. Post. Illustrated with diagrams. This is a complete description of the hitches, knots, and apparatus used in making and carrying loads of various kinds on horseback. Its basis is the methods followed in the West and in the American Army. The diagrams are full and detailed, giving the various hitches and knots at each of the important stages so that even the novice can follow and use them. It is the only book ever published on this subject of which this could be said. Full description is given of the ideal pack animal, as well as a catalogue of the diseases and injuries to which such animals are subject.

50. *LEARNING TO SWIM, by L. de B. Handley. Illustrated. Constructed especially for the beginner who has no knowledge of the first steps. Explains the formation of the strokes, how to acquire confidence in the water and gives full details as to the various methods, including those used by experts and racing swimmers.

51. *SMALL BOAT NAVIGATION, by Lieut. Com. F. W. Sterling, U. S. N. Retired. Illustrated with diagrams. A complete description of the instruments and methods necessary in navigating small boats in pilot waters, on soundings, and off shore. Describes the taking of sights for position, the running of courses, taking soundings, using the chart, plotting compass courses, etc. Several chapters are given over to the seamanship side of navigation, explaining the handling of small boats under various conditions.

52. *TOURING AFOOT, by Dr. C. P. Fordyce. Illustrated. This book is designed to meet the growing interest in walking trips and covers the whole field of outfit and method for trips of varying length. Various standard camping devices are described and outfits are prescribed for all conditions. It is based on the assumption that the reader will want to carry on his own back everything that he requires for the trip.

53. THE MARINE MOTOR, by Lieut. Com. F. W. Sterling, U. S. N. (Ret.). Illustrated with diagrams. This book is the product of a wide experience on the engineering staff of the United States Navy. It gives careful descriptions of the various parts of the marine motor, their relation to the whole and their method of operation; it also describes the commoner troubles and suggests remedies. The principal types of engines are described in detail with diagrams. The object is primarily to give the novice a good working knowledge of his engine, its operation and care.

54. *THE BEGINNER'S BEE BOOK, by Frank C. Pellett. Illustrated. This book is designed primarily for the small scale bee farmer. It discusses the different varieties of bees and their adaptability to different conditions, the construction of hives, care and feeding at various times of the year, handling of bees, and the types of locations and feed most suitable for bee culture.

55. *THE POINTER, by Williams Haynes. Contains chapters on the history and development of the breed, selection of dog, breeding, kenneling, and training. Also contains information on common sense remedies for ordinary diseases.

56. *THE SETTER, by Williams Haynes. The author takes up the origin and history of the breed, its development, breeding, kenneling, and training. He also discusses the various diseases to which they are subject and treatment therefor.

57. *PRACTICAL BAIT CASTING, by Larry St. John. Illustrated. This book deals with tackle and methods used in catching black bass. It is based upon a wide and varied experience in the middle West, where more bass fishing is done than in any other part of the country.

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